

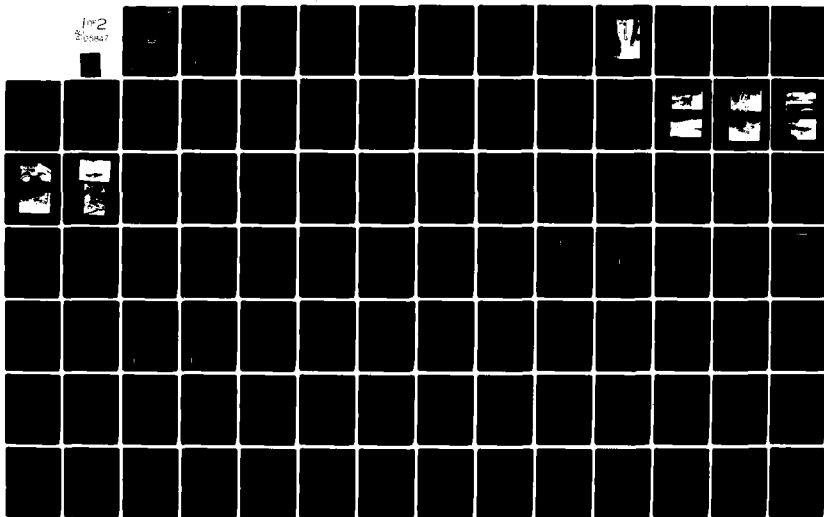
AD-A105 847

NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. MECHANICVILLE RESERVOIR DAM (INVEN--ETC(U)
AUG 81 G KOCH DACW51-79-C-0001

UNCLASSIFIED

NL

102
200007



LEVEL II

6

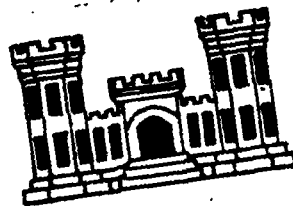
UPPER HUDSON RIVER BASIN

MECHANICVILLE RESERVOIR DAM

SARATOGA COUNTY, NEW YORK
INVENTORY NO. N.Y. 1061

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

AD A105847



APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED

DTIC FILE COPY

NEW YORK DISTRICT CORPS OF ENGINEERS
JUNE, 1981

DTIC
ELECTE
OCT 10 1981

D

19

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM	
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER	
	AD-A105	847	
4. TITLE (and Subtitle) Phase I Inspection Report Mechanicville Reservoir Dam Upper Hudson River Basin, Saratoga County, N.Y. Inventory No. 1061		5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program	
7. AUTHOR(s) GEORGE KOCH		9. CONTRACT OR GRANT NUMBER(s) DACW51-79-C-0001	
8. PERFORMING ORGANIZATION NAME AND ADDRESS New York State Department of Environmental Conservation 50 Wolf Road Albany, New York 12233		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
11. CONTROLLING OFFICE NAME AND ADDRESS Department of the Army 26 Federal Plaza New York District, CofE New York, New York 10287		12. REPORT DATE 26 August 1981	
13. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Department of the Army 26 Federal Plaza New York District, CofE New York, NY 10287		14. SECURITY CLASS. (of this report) UNCLASSIFIED	
15. DISTRIBUTION STATEMENT (of this Report) Approved for public release; Distribution unlimited.		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) National Dam Safety Program. Mechanicville Reservoir Dam (Inventory Number NY 1061), Upper Hudson River Basin, Saratoga County, New York. Phase I Inspection Report.			
18. SUPPLEMENTARY NOTES			
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Dam Safety National Dam Safety Program Visual Inspection Hydrology, Structural Stability		Mechanicville Reservoir Dam Saratoga County Upper Hudson River Basin	
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to life or property. However, the dam has some deficiencies which need to be evaluated and remedied.			

Using the Corps of Engineers' Screening Criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 20% of the Probable Maximum Flood (PMF) inflows. Since failure of the dam would increase the hazard to downstream residents, the spillway capacity is adjudged as seriously inadequate and the dam is assessed as "unsafe, non-emergency".

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

Due to the severity of the spillway inadequacy, it is recommended that the stop logs on the drop inlet structure should be removed to lower the reservoir level, and to provide additional spillway capacity. The stop logs should not be replaced until appropriate mitigating measures have been taken. A system for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented. An emergency action plan for the notification and evacuation of downstream residents should also be developed and implemented.

It is recommended that within 3 months of the date of notification of the owner, a detailed hydrologic/hydraulic investigation of the structure should be commenced. Mitigating measures deemed necessary as a result of these investigations should be completed within 18 months. Stop logs should not be replaced until appropriate mitigating measures have been completed.

Inspection of the three outlet pipes revealed varying degrees of differential settlement along each of the pipes. Such settlement indicates that the pipes may have actually separated at the joints. Investigations of the differential settlement of the three pipes, should also be commenced within 3 months. Any serious problems discovered should be corrected within 12 months of the date of notification of the owner.

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
MECHANICVILLE RESERVOIR DAM
I.D. NO. NY-1061
#225A-142 UPPER HUDSON RIVER BASIN
SARATOGA COUNTY, NEW YORK

	<u>TABLE OF CONTENTS</u>	<u>PAGE NO.</u>
-	ASSESSMENT	
-	OVERVIEW PHOTOGRAPH	
1	PROJECT INFORMATION	1
	1.1 GENERAL	1
	1.2 DESCRIPTION OF PROJECT	1
	1.3 PERTINENT DATA	2
2	ENGINEERING DATA	4
	2.1 GEOTECHNICAL DATA	4
	2.2 DESIGN RECORDS	4
	2.3 CONSTRUCTION RECORDS	4
	2.4 OPERATION RECORDS	4
	2.5 EVALUATION OF DATA	4
3	VISUAL INSPECTION	5
	3.1 FINDINGS	5
	3.2 EVALUATION OF OBSERVATIONS	7
4	OPERATION AND MAINTENANCE PROCEDURES	8
	4.1 PROCEDURE	8
	4.2 MAINTENANCE OF DAM	8
	4.3 WARNING SYSTEM IN EFFECT	8
	4.4 EVALUATION	8

	<u>PAGE NO.</u>
5 HYDROLOGIC/HYDRAULIC	9
5.1 DRAINAGE AREA CHARACTERISTICS	9
5.2 ANALYSIS CRITERIA	9
5.3 SPILLWAY CAPACITY	9
5.4 RESERVOIR CAPACITY	10
5.5 FLOODS OF RECORD	10
5.6 OVERTOPPING POTENTIAL	10
5.7 EVALUATION	10
6 STRUCTURAL STABILITY	11
6.1 EVALUATION OF STRUCTURAL STABILITY	11
7 ASSESSMENT/RECOMMENDATIONS	12
7.1 ASSESSMENT	12
7.2 RECOMMENDED MEASURES	13

APPENDIX

- A. PHOTOGRAPHS
- B. VISUAL INSPECTION CHECKLIST
- C. HYDROLOGIC/HYDRAULIC: ENGINEERING DATA AND COMPUTATIONS
- D. REFERENCES
- E. DRAWINGS AND RELATED DOCUMENTS

Phase I Inspection Report
National Dam Safety Program

Name of Dam: Mechanicville Reservoir Dam
(I.D. No. NY-1061)

State Located: New York

County: Saratoga

Watershed: Upper Hudson River Basin

Stream: Plum Brook

Date of Inspection: April 2, 1981

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to life or property. However, the dam has some deficiencies which need to be evaluated and remedied.

Using the Corps of Engineers' Screening Criteria for initial review of spillway adequacy, it has been determined that the dam would be overtopped by all storms exceeding 20% of the Probable Maximum Flood (PMF) inflows. Since failure of the dam would increase the hazard to downstream residents, the spillway capacity is adjudged as seriously inadequate and the dam is assessed as "unsafe, non-emergency".

The classification of "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

Due to the severity of the spillway inadequacy, it is recommended that the stop logs on the drop inlet structure should be removed to lower the reservoir level, and to provide additional spillway capacity. The stop logs should not be replaced until appropriate mitigating measures have been taken. A system for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented. An emergency action plan for the notification and evacuation of downstream residents should also be developed and implemented.

It is recommended that within 3 months of the date of notification of the owner, a detailed hydrologic/hydraulic investigation of the structure should be commenced. Mitigating measures deemed necessary as a result of these investigations should be completed within 18 months. Stop logs should not be replaced until appropriate mitigating measures have been completed.

Inspection of the three outlet pipes revealed varying degrees of differential settlement along each of the pipes. Such settlement indicates that the pipes may have actually separated at the joints. Investigations of the differential settlement of the three pipes, should also be commenced within 3 months. Any serious problems discovered should be corrected within 12 months of the date of notification of the owner.

Several other deficiencies were noted on this structure. The worst of these deficiencies were trees and brush growing on the entire embankment. All trees and brush should be cut and removed as soon as possible to permit a detailed inspection of the embankment. The remainder of the deficiencies should be corrected within 12 months of the date of notification.

Among the actions required are the following:

1. Establishing a good grass cover on the embankment slopes;
2. Treating the soft and wet areas at the base of the downstream slope;
3. Protecting the embankment toe from erosion caused by Plum Brook main stem flow;
4. Repairing concrete on the drop inlet structure;
5. Correcting deficiencies on the laid-up stone headwall at the outlet of the spillway pipes.

George Koch RW

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer

Date:

26 Aug 81



OVERVIEW
MECHANICVILLE RESERVOIR DAM
I.D. No. NY-1061

Phase I Inspection Report
National Dam Safety Program
Mechanicville Reservoir Dam
I.D. No. NY-1061
#225A-142 Upper Hudson River Basin
Saratoga County, New York

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam

- The Mechanicville Reservoir Dam is an earth dam having a drop inlet spillway containing three discharge conduits plus a smaller cast-iron standpipe leading to a water supply conduit.

The embankment is 380 feet long and about 30 feet high. The crest of the embankment is about 20 feet wide. The slopes of the embankment are somewhat variable but generally, the upstream slope is 1 vertical on 2 horizontal and the downstream slope is 1 vertical on 2.5 to 3 horizontal. There is small stone rip-rap on the lower portion of the upstream slope.

The spillway entrance consists of a concrete and masonry drop inlet structure covered with a wooden roof. The structure is square with each side about 15 feet long. There is a masonry post on each corner which supports the roof structure. Along each side are steel pins, 12 inches on center, that support 26 inches of wood stop logs. Within the structure, 30 inch diameter reinforced concrete pipe (RCP) sections form vertical risers leading to the outlet pipes. There are three risers, each consisting of three RCP sections with a vertical drop of 9 feet. The three outlet pipes are 30" diameter cast iron pipes laid in 12 foot long sections. There is a laid-up stone headwall at the outlet end of the pipes.

The outlet works standpipe consists of 16 inch cast iron pipe sections of

varying length. It has three valves which control flow into ports at three different elevations. The standpipe then leads to a 16 inch supply main. There are two brick manholes at the downstream toe of the dam, near the spillway outlet pipes. One of these contains a valve off the 16 inch supply line leading to a 16 inch blow-off line. The other manhole contains a valve regulating flow in the supply line.

b. Location

This dam is located off George Thompson Road in the Town of Stillwater. The reservoir is approximately 1.25 miles north of the hamlet of Willow Glen on New York State Route 67. The dam is approximately 2.5 miles northwest of the City of Mechanicville.

c. Size Classification

The dam is 30 feet high and has a storage capacity of 322 acre-feet. Therefore, the dam is in the small size category as defined by the "Recommended Guidelines for the Safety Inspection of Dams."

d. Hazard Classification

The dam is classified as "high" hazard due to the presence of approximately 10-15 homes in the hamlet of Willow Glen about 1.25 miles south of the dam.

e. Ownership

The dam is owned by the City of Mechanicville. It is under the jurisdiction of the city's Department of Public Works. Mr. Michael Ennello is the Commissioner of Public Works. His office is at the city garage on South Central Avenue, Mechanicville, New York 12118 and his phone number is (518) 664-7171. Mr. Vincent Barber is the Water Superintendent for the city. His phone number at the Water Treatment Plant is (518) 664-3751.

f. Purpose of Dam

This dam is used as a water supply for the City of Mechanicville. A 16 inch supply main leads from the dam to the water treatment plant in Willow Glen. This line is approximately 6100 feet long.

g. Design and Construction History

This dam was constructed in 1892. Modifications to the structure were made in 1927. At that time, a stop log structure was constructed making it possible to raise the reservoir level by about 3 feet.

h. Normal Operating Procedures

Water is withdrawn from the reservoir as required by the City. This reservoir is used as a secondary supply system. The primary source of supply is a smaller reservoir approximately one mile downstream of this dam. Therefore, the water from the Mechanicville Reservoir is used on an irregular basis, primarily during the winter months.

1.3 PERTINENT DATA

a. <u>Drainage Area (sq.mi.)</u>	2.19
b. <u>Discharge at Dam</u>	(cfs)
Spillway (no stop logs) - water @ top dam	343

c. Elevation (USGS Datum)

Top of Dam 268.5

Normal Pool 263

d. Reservoir - Surface Area (acres)

Top of Dam 35

Normal Pool 22

e. Storage Capacity (acre-feet)

Top of Dam 322

Normal Pool 201

f. Dam

Type - Earth embankment with small rip rap on upstream face.

Embankment length (ft) 380

Slopes (V:H) Upstream (approximate) 1 on 2
Downstream (varies) 1 on 2.5 to 1 on 3

Crest width (ft) 20

g. Spillway - Drop Inlet

Type: Square masonry drop inlet structure with wooden roof;
stop logs on each face; three 30 inch diameter risers leading
to three 30 inch diameter pipes form outlet.

Length of Weir (ft) 49

h. Outlet Works - Standpipe

Type - 16 inch cast iron pipe; three valves controlling three inlet
ports at different elevations, leads to 16 inch supply main; two
valves at downstream toe; one leading to 16 inch blow-off line and
one on supply line.

SECTION 2: ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Mechanicville Reservoir Dam is located in the Hudson Valley physiographic province of New York State. Bedrock in the vicinity of the dam dates from the Ordovician Era (approximately 500 million years ago). Limestone, dolomite, shale and sandstone are the predominant types of rock in this area. A review of the "Brittle Structures Map of the State of New York" indicates there are no faults in the immediate vicinity of the dam.

Surficial soils in the area consist of glacial drift from the Wisconsin glaciation.

b. Subsurface Investigations

No records of any subsurface investigations performed in the vicinity of this structure could be located.

2.2 DESIGN RECORDS

There were no design records available.

2.3 CONSTRUCTION RECORDS

There were no construction records available for this structure. The dam was constructed in 1892. Modifications to the structure were reportedly completed in 1927.

The only information which was available was two drawings which showed plan views of the reservoir. One of these was dated 1892 and the other was dated 1924. The 1892 plan indicated that there was an auxiliary spillway channel at the left end of the dam, but this channel does not presently exist. It is not known whether it was ever built.

2.4 OPERATION RECORDS

No operation records are maintained on this structure.

2.5 EVALUATION OF DATA

Information used for the preparation of this report was obtained from the Department of Environmental Conservation files, from the City of Mechanicville files, and from measurements made at the time of the inspection. The analysis performed for this report were based primarily on field measurements taken during the visual inspection.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Mechanicville Reservoir Dam was conducted on April 2, 1981. The weather was overcast with temperatures in the low fifties. The water surface at the time of inspection was 3 inches below the top of the stop logs on the spillway drop inlet (3.5 feet below the top of dam).

b. Embankment

Visual inspection of the embankment was hampered by trees and brush growing on both slopes and the crest. In addition to the live vegetation, there were a number of fallen trees on the downstream slope. These were reported to have been cut 10 to 15 years ago. Stumps from these trees still remain on both slopes. The resulting piles of brush made a detailed inspection impossible.

In spite of these conditions, several deficiencies were observed on this structure. The crest of the embankment was fairly level, although there were some low spots. A motor bike path had been worn along the entire length of the crest.

Several deficiencies were noted on the downstream slope. There was a soft area near the toe of the slope. This area extended for a distance approximately equal to the middle third of the embankment and was located in the middle portion of the embankment. There was one rectangular area near the right end (looking downstream) of the soft area where standing water was observed. However, there were no points of concentrated seepage. Another deficiency noted was that some bent trees were noted on the downstream slope. This could be an indication of movement of the slope. No cracks, sloughs or other indications of recent movements were noted, but the trees and brush prevented a detailed inspection of this area.

c. Spillway

The masonry drop inlet structure was in fair condition. There was some cracked and broken concrete on the interior of the structure (near the three wells leading to the outlet conduits). The stop logs on each side of the structure were placed in the fall of 1980 and were in good condition. There was minor leakage between the logs and some leakage under the logs as well. Some of the pins supporting these stop logs were bent. The timber roof on this drop inlet was in poor condition. Many of the roof boards were rotted or missing. The corrugated metal sheets which had covered the left side of the roof were missing. Those on the right side were bent up on the corners, although they were still in place. The vertical RCP riser leading to the outlet pipes was in satisfactory condition.

The cast iron outlet pipes at the outlet headwall have relatively the same invert elevation. However, looking back up into the pipe sections revealed varying degrees of differential settlement along each of the pipe inverts. The major changes in slope seemed to occur at pipe joints, with the most serious irregularities found inside pipe #2 (Appendix C; drawing "Spillway Outlet Structure"). Such settlement indicates that the pipes may have actually separated at the joints.

The laid-up stone headwall for the three outlet pipes was in need of repair. There were stones missing from the wall in several spots. The worst of these was a void approximately 1 foot deep by 2 feet high between the second and third outlet pipes (see photos). There was evidence of scour behind the right end of the headwall.

d. Standpipe

The standpipe appeared to be in satisfactory condition. There were two support cables leading from the standpipe and buried in the ground at either end of the dam. The three valves on the standpipe remain open at all times, but are reportedly operational.

A 16 inch supply main leads from the base of the standpipe to two brick manholes at the downstream toe of the dam. The concrete facing on the two manholes was somewhat deteriorated. A 16 inch blow-off pipe which comes out of one of the manholes appeared to be in satisfactory condition. There were several inches of sediment in the invert of this pipe. The other manhole contains a valve controlling flow in the supply line leading to the treatment plant. Both of these valves were reported to be operational.

e. Reservoir

There were no signs of instability in the reservoir area. The area surrounding the reservoir was forested up to the water surface. The slopes rising from the reservoir were relatively steep, especially along the western side.

f. Downstream Channel

The outlet channel was in satisfactory condition. The Plum Brook main-stem flows near the downstream toe of the embankment at the right end of the dam. The brook takes a right angle bend away from the dam near the midpoint of the embankment. There was some evidence of scour on the outside of the bend. The scoured area was beginning to infringe on the toe of the embankment.

3.2 EVALUATION OF OBSERVATIONS

Visual inspection revealed several deficiencies on this structure. The following items were noted:

1. Trees and brush growing on the entire embankment, making a detailed inspection impossible.
2. A soft area at the downstream toe of the slope, and, at one end of this soft area, a rectangular wet area.
3. Differential settlement of the three spillway pipes at their outlet.
4. Bent trees on the downstream slope which are possible indications of movement of the slope.
5. Missing stones and other deficiencies on the laid-up stone headwall at the outlet of the spillway pipes.
6. Deterioration of the timber roof on the drop inlet structure.
7. Scour from Plum Brook which was impinging on the downstream toe of the embankment.
8. A motor bike path which had been worn into the crest.
9. Minor cracking and deterioration of concrete on the drop inlet structure.
10. Minor deterioration on the two manholes on the 16 inch supply line.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

There are no prescribed operating procedures for this dam. This reservoir is used as a back-up water supply for the City of Mechanicville. Water is withdrawn from the reservoir when required.

4.2 MAINTENANCE OF DAM

There is no established maintenance plan for this dam.

4.3 WARNING SYSTEM IN EFFECT

No apparent warning system for evacuation of downstream resident is present.

4.4 EVALUATION

The operation of this reservoir is satisfactory. The maintenance of the dam has been unsatisfactory. Increased maintenance efforts are required to correct deficiencies noted in Section 3.

SECTION 5: HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The delineation of the contributing watershed to this dam is indicated on the map titled "Drainage Area Map - Mechanicville Reservoir Dam" (Appendix C). The irregular but somewhat rectangular-shaped, north-south oriented watershed of some 2.19 square miles (1400 acres) is comprised of relatively undeveloped lands consisting of primarily forest and some open fields. The forest, within the watershed, is part of the larger 6800 acre Luther Forest area. Bank slopes along the primary drainage paths are moderate to steep due to erosion and downcutting of the surficial sandy soils. Slopes beyond the banks of the drainageways are moderate to flat. Elevations along the hills forming the watershed divide range from 70 to 140 feet above the reservoir. Adjacent and partly within the upper reaches of the watershed is a sizeable wetland located east of Black Pond. There are no other significant size bodies of water nor are there any known flow diversions either into or out of the watershed.

5.2 ANALYSIS CRITERIA

No hydrologic/hydraulic information was available regarding the original design for this dam. Therefore, the analysis of the floodwater retarding capability of the dam was performed using the Corps of Engineers HEC-1 computer program, Dam Safety version. The computer program develops an inflow hydrograph using the "Snyder Unit Hydrograph" method and then reservoir routs the hydrograph using the "Modified Puls" flood routing procedure. The spillway design flood selected for analysis was the Probable Maximum Flood (PMF), in accordance with the Recommended Guidelines of the U.S. Army Corps of Engineers. The PMF event is that hypothetical storm event resulting from the most critical combination of rainfall, minimum soil retention, and direct runoff to a specific site that is considered reasonably possible for a particular watershed. Precipitation values used in the analysis were obtained from the Weather Bureau publication HMR 33. Soil retention rates selected were an initial loss of 1.0 inches and a constant loss of 0.2 inches per hour. These rates were used because of the highly permeable soils located throughout the entire watershed.

5.3 SPILLWAY CAPACITY

The single, square, drop inlet spillway has a concrete crest and three, 30 inch diameter, vertical concrete risers leading to the outlet pipes. Entirely surrounding the four-sided crest are 26 inch high stoplogs. Some additional outflows are possible via the vertical standpipe. However, for the floodwater analysis, the discharges through the standpipe outlet works were not included. The single spillway was analyzed with no stoplogs in place. For low head condition, the spillway discharges were computed using a weir flow discharge coefficient, C , of 3.2. As reservoir levels rise, discharge becomes limited by the capacity of the three outlet pipe conduits. The computed discharge capacity of the spillway without stoplogs in-place is 343 cfs.

The flood analysis performed for this dam indicates that the spillway does not have sufficient capacity for discharging one-half the PMF. For this storm event, the peak inflow and the peak outflow is 1587 cfs. The PMF peak inflow and peak outflow is 3171 cfs.

5.4 RESERVOIR CAPACITY

The normal water surface varies because of water supply withdrawals which are dependent upon consumer demand. Maximum normal pool is at or near the top of the stoplogs, (elevation 265.2) . Water supply withdrawals via the standpipe openings may lower the pool to about the reservoir bottom, providing the outflow capacity exceeds the inflows from watershed runoff.

The impounded capacity at the spillway crest (elevation 263-USGS) is 201 acre-feet. Surge storage capacity to the top-of-dam (elev. 268.5) adds 121 acre-feet which is equivalent to a direct runoff depth of 1.04 inches over the watershed. The total storage capacity is 322 acre-feet.

5.5 FLOODS OF RECORD

The date of occurrence of the maximum flood at the dam site is not known.

5.6 OVERTOPPING POTENTIAL

Analyses using the PMF and one-half the PMF storm events indicates that the spillway does not have sufficient discharge capacity. The computed depths of overtopping for these two events are 1.99 feet and 1.15 feet respectively. All storm events exceeding 20% of the PMF will result in the dam being overtopped.

5.7 EVALUATION

The spillway capacity is inadequate for the peak outflow from one-half the PMF. Overtopping of the earth embankment is likely to cause dam failure. Therefore, a dam-break analysis, assuming a breaching of the dam, was performed. The analysis indicates that water surface levels downstream of the dam near the hamlet of Willow Glen could reach depths which would pose a significant danger to residents. That is, dam failure resulting from overtopping would significantly increase the hazard to loss of life downstream from the dam from that which would exist just before an overtopping failure. Therefore, the spillway is adjudged as "seriously inadequate" and the dam is assessed as "unsafe, non-emergency".

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

Visual observations of the structure were limited by the trees and brush growing on the dam. However, there were several deficiencies noted. A soft area was noted near the downstream toe which extended along the middle third of the embankment. There was a rectangular wet area near the right end of this soft section. Standing water was observed in this area, but there were no points of concentrated seepage. Some bent trees were noted on the downstream slope. While no cracks or slough were noted, these trees could be an indication of slope movements.

b. Design and Construction Data

No information was available concerning the original design or construction of this dam. One plan sheet from 1892 was available, but it indicated that an auxiliary spillway channel was to be constructed at the left end of the dam. No such spillway channel presently exists.

c. Seismic Stability

This dam is located in Seismic Zone 2. No seismic stability analysis was performed on this structure.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

The Phase I inspection of the Mechanicville Reservoir Dam revealed that the spillway is seriously inadequate and outflows from all storms exceeding 20% of the Probable Maximum Flood would overtop the dam. Since an overtopping induced failure would significantly increase the hazard to downstream residents, the dam is assessed as unsafe-non-emergency.

In addition to the spillway inadequacy, other deficiencies were noted which affect the safety of this structure. Among the deficiencies observed were differential settlement of the three spillway pipes at their outlet end, a soft area at the downstream toe of the slope, scour from Plum Brook impinging on the downstream toe of the embankment and bent trees on the downstream slope indicating possible slope movements.

b. Adequacy of Information

The information which was available for the preparation of this report was extremely limited. Sketches developed from field measurements taken at the time of the inspection were used to determine the discharge capacity of the spillway.

c. Need for Additional Investigations

Since the spillway has been assessed as seriously inadequate, additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. Analysis will then be required to determine appropriate mitigating measures in response to the seriously inadequate spillway capacity.

Also, the extent of the differential settlement within the spillway pipes should be determined and monitored. This investigation should be conducted in conjunction with determining any movement of the downstream slope.

d. Urgency

The additional hydrologic/hydraulic investigations which are needed should be commenced within 3 months of the date of notification of the owner, and the mitigating measures deemed necessary as a result of the investigation should be completed within 18 months of the date of notification. The investigations of the differential settlement problem as well as the possible movement of the downstream slope should also be commenced within 3 months of the date of notification. Any serious problems discovered and/or any worsening of either condition should receive prompt remedial action. All other deficiencies should be corrected within 12 months of the date of notification.

7.2 RECOMMENDED MEASURES

- a. Due to the serious deficiency in spillway capacity, remove the stop logs and lower the reservoir level pending the results of the detailed hydrologic/hydraulic analysis.
- b. After the hydrologic/hydraulic investigation has been completed, mitigating measures dealing with the seriously inadequate spillway capacity should be undertaken.
- c. As a result of the investigation relating to the differential settlement of the spillway outlet pipes, and possible movement of the downstream embankment slope, remedial measures should be undertaken.
- d. Trees and brush growing on the embankment should be cut and the slope cleared as soon as possible. Upon completion of the clearing, a detailed inspection of the embankment should be conducted.
- e. After the embankment is cleared, a good grass cover should be established to provide erosion protection.
- f. The soft and wet areas near the downstream toe should be treated in an appropriate manner to permit the water to drain without disturbing the soil particles which form the slope.
- g. Actions should be taken which will protect the toe of the embankment from scour caused by Plum Brook.
- h. The cracking and deterioration of concrete on the drop inlet structure should be repaired.
- i. Missing stones and other deficiencies on the laid-up stone head-wall at the outlet of the principal spillway pipes should be repaired.
- j. An emergency action plan for the notification of downstream residents should be developed and implemented.

APPENDIX A

PHOTOGRAPHS



Embankment Crest; Note Brush Growing on Dam



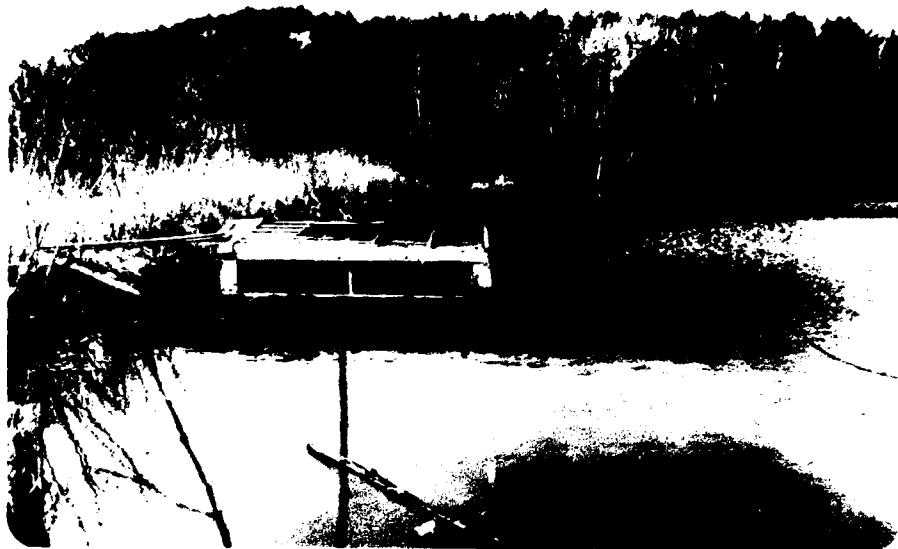
Upstream Slope of the Embankment



Downstream Slope of Embankment; Note
Trees and Brush Growing on Slope



Downstream Slope; Note Bent Trees indicating
Possible Past Movement of Slope



Concrete Drop Inlet Structure with
Timber Roof; Cast Iron Standpipe in Background



Drop Inlet Structure; Note Stop Logs in Place
on all Sides.



Three Wells within Drop Inlet Structure
Leading to Spillway Outlet Pipes; Note
Cracked Concrete



Spillway Outlet Pipes and Manholes
Containing Valves on 16 inch Supply Main



Stream Which Flows Near Downstream Toe of Embankment



Wet Area at Downstream Toe of the Embankment

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam MECHANICVILLE RESERVOIR DAM
Fed. I.D. # NY-1061 DEC Dam No. 225A-142
River Basin UPPER HUDSON
Location: Town STILLWATER County SARATOGA
Stream Name _____
Tributary of PLUMB BROOK
Latitude (N) 42°56.3' Longitude (W) 73°43.9'
Type of Dam EARTH EMBANKMENT
Hazard Category HIGH
Date(s) of Inspection 4/2/81
Weather Conditions 50° OVERCAST
Reservoir Level at Time of Inspection 3.5' BELOW TOP OF DAM

b. Inspection Personnel R. WARRENDER W. LYNICK

c. Persons Contacted (Including Address & Phone No.) _____
VINCE BARBER, WATER SUPERINTENDENT (518) 664-3751
MICHAEL ENNELLO, COMMISSIONER OF PUBLIC WORKS
(518) 664-7171

d. History:

Date Constructed 1892 Date(s) Reconstructed 1927

Designer _____

Constructed By _____

Owner CITY OF MECHANICVILLE

2) Embankment

a. Characteristics

- (1) Embankment Material UNKNOWN
- (2) Cutoff Type ~~Form~~ UNKNOWN
- (3) Impervious Core POSSIBLY HAS CONCRETE CORE WALL, BUT PLANS DON'T SHOW IT & NO EVIDENCE IN FIELD
- (4) Internal Drainage System NONE
- (5) Miscellaneous _____

b. Crest

- (1) Vertical Alignment SOMEWHAT UNEVEN - OCCASSIONAL LOW SPOTS
- (2) Horizontal Alignment SATISFACTORY
- Surface Cracks NONE NOTED
- (4) Miscellaneous BIKE PATH RUNS LENGTH OF CREST - SUBSTANTIAL BRUSH ON EITHER SIDE OF PATH

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1 ON 2 - SOMEWHAT VARIABLE
- (2) Undesirable Growth or Debris, Animal Burrows SUBSTANTIAL BRUSH COVER - STUMPS FROM OLD TREES
- (3) Sloughing, Subsidence or Depressions NONE NOTED

(4) Slope Protection SMALL RIPRAP ON LOWER PART OF SLOPE

(5) Surface Cracks or Movement at Toe UN OBSERVABLE

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 ON 2.5 TO 1 ON 3

(2) Undesirable Growth or Debris, Animal Burrows COVERED WITH BRUSH & TREES - LOTS OF BRUSH & CUT TREES FROM PREVIOUS CUTTING

(3) Sloughing, Subsidence or Depressions NO CRACKS OBSERVED BUT THERE WERE SOME BENT TREES ON SLOPE INDICATING PRIOR MOVEMENTS

(4) Surface Cracks or Movement at Toe NONE OBSERVED BUT BRUSH AND TREES PREVENTED CLOSE INSPECTION

(5) Seepage ONE SOFT AREA EXTENDED ALONG TOE IN ABOUT MIDDLE THIRD OF DAM - AT ONE END OF THIS WET AREA THERE WAS A RECTANGULAR WET AREA ABOUT 10' X 20'. GROUND SOFT & SOME STANDING WATER OBSERVED. AREA WAS AT RIGHT END OF WET AREA.

(6) External Drainage System (Ditches, Trenches; Blanket) NONE

NO ACTUAL SEEPAGE OBSERVED

(7) Condition Around Outlet Structure SOME SCOUR ON RIGHT END OF SPILLWAY HEADWALL

(8) Seepage Beyond Toe WET AREA NOTED ABOVE

e. Abutments - Embankment Contact

RIGHT ABUTMENT VERY STEEP

LEFT ABUTMENT FAIRLY STEEP

(1) Erosion at Contact NONE

(2) Seepage Along Contact NONE

3) Drainage System

a. Description of System NONE

b. Condition of System _____

c. Discharge from Drainage System _____

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) _____

NONE

5) Reservoir

- a. Slopes FAIRLY STEEP SLOPES - ESPECIALLY ON RIGHT BANK
- b. Sedimentation NONE NOTED
- c. Unusual Conditions Which Affect Dam PLANNED HOUSING DEVELOPMENT WILL COVER LARGE PART OF WATERSHED

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) 10-15 HOUSES IN WILLOW GLEN; LOWER RESERVOIR & WATER TREATMENT PLANT; STATE HIGHWAY
- b. Seepage, Unusual Growth NONE
- c. Evidence of Movement Beyond Toe of Dam SOME SCOUR ON BEND IN PLUM BROOK - STARTING TO IMPINGE ON TOE OF EMBANKMENT
- d. Condition of Downstream Channel PLUM BROOK RUNS NEAR TOE OF EMBANKMENT & THEN BENDS AWAY.

7) Spillway(s) (Including Discharge Conveyance Channel)

- DROP INLET WITH 3 OUTLET PIPES
STAND PIPE WITH 16" OUTLET PIPE
- a. General DROP INLET PASSES NORMAL FLOWS & PUTS WATER INTO PLUM BROOK; STAND PIPE HAS THREE INLET PORTS - VALVES ALWAYS OPENED - LEADS TO 16 INCH SUPPLY LINE
AUX. SPILLWAY CHANNEL SHOWN ON PLANS DOES NOT EXIST
 - b. Condition of Service Spillway DROP INLET STRUCTURE IN FAIRLY GOOD CONDITION. SOME CRACKED & BROKEN CONCRETE ON CREST ALONG ENTIRE EMBANKMENT SIDE EDGE - OTHER 3 SIDES ARE OKAY - SOME CRACKED CONCRETE ON INLET FLOOR AS WELL - WELL PITS & UPSTREAM PART OF PIPES LOOK OKAY. FLASHBOARDS ON SIDES WERE INSTALLED IN FALL, 1980
SOME LEAKAGE BETWEEN BOARDS & UNDER THEM AT MASONRY JOINTS BUT OTHERWISE IN GOOD CONDITION
SOME OF PINS ~~ARE~~ HOLDING BOARDS WERE BENT

TIMBER ROOF ON DROP INLET IN STATE OF DISREPAIR. ROOF
BOARDS ROTTEN & SOME COMPLETELY GONE. CORRUGATED METAL ROOF
GONE ON LEFT SIDE; BENT UP ON RIGHT.

OUTLET PIPES - 3 PIPES ON VARYING SLOPES. SOME MINOR
DISPLACEMENT OF JOINTS NOTED

HEADWALL - LAID UP STONE - SOME STONES MISSING - 1' deep
BY 2' HIGH VOID BETWEEN PIPES 2 & 3 - SOME SCOUR (REMOVED
BACKFILL) ADJACENT TO RIGHT SIDE

c. Standpipe Spillway STANDPIPE OUT IN RESERVOIR - 2 CABLES
LEADING TO SHORE SUPPORT IT. THREE ^{REPORTEDLY OPERABLE} VALVES AT DIFFERENT
ELEVATIONS CONTROL FLOW INTO PIPE. 16" LINE LEADS TO
2 MANHOLES AT DOWNSTREAM TOE - BOTH BRICK MANHOLES WITH
SOME DETERIORATION - FIRST ON HAS VALVE FOR 16" BLOWOFF PIPE
OTHER HAS VALVE FOR SUPPLY PIPE
d. Condition of Discharge Conveyance channel STEEP SIDE SLOPES
SOME DEBRIS IN CHANNEL

8/Reservoir Drain/Outlet

STAND PIPE CAN SERVE THIS FUNCTION - ALTHOUGH
ELEVATION OF LOWEST OPENING IS UNKNOWN

9/Operation Procedures

NO SPECIAL OPERATION PROCEDURES.

10/APPURTENANT STRUCTURES

NONE

11/STRUCTURAL

DESCRIPTION PROVIDED IN SPILLWAY SECTION

APPENDIX C

HYDROLOGIC/HYDRAULIC
ENGINEERING DATA AND COMPUTATIONS

MECHANICVILLE
RESV. DAM
NY-1061

1

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	(USGS DATUM) <u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>268.5</u>	<u>35</u>	<u>322</u>
2) Design High Water (Max. Design Pool)	<u>NA</u>	<u> </u>	<u> </u>
3) Auxiliary Spillway Crest	<u>NA</u>	<u> </u>	<u> </u>
4) Pool Level with Flashboards	<u>265.2</u>	<u> </u>	<u> </u>
5) Service Spillway Crest	<u>263.0</u>	<u>22</u>	<u>201</u>

DISCHARGES

	<u>Volume</u> (cfs)
1) Average Daily	<u>N/A</u>
2) Spillway @ Maximum High Water (NO STOPLOGS)	<u>343</u>
3) Spillway @ Design High Water	<u>N/A</u>
4) Spillway @ Auxiliary Spillway Crest Elevation	<u>N/A</u>
5) Low Level Outlet (STANDPIPE - 3 OUTLETS)	<u>UNKNOWN</u>
6) Total (of all facilities) @ Maximum High Water	<u>± 350</u>
7) Maximum Known Flood	<u>UNKNOWN</u>
8) At Time of Inspection	<u>N/A</u>

MECHANICVILLE
RESV. DAM
NY-1061 2

CREST:

(USGS)
ELEVATION: 268.5

Type: EARTH w/ VEGETATIVE COVER + BRUSH & TREES

Width: 20' Length: 380'

Spillover N/A

Location N/A

SPILLWAY:

SERVICE

AUXILIARY

263

(CREST)
Elevation

12' SQUARE WEIR w/ 3
VERTICAL 30" DIA. DROP INLETS
12"

Type NONE

Width

Type of Control

Uncontrolled

✓

Controlled:

2.2' HIGH WOODEN STOPLOGS
ALL AROUND

Type
(Flashboards; gate)

Number

Size/Length

Invert Material

Anticipated Length
of operating service

N/A Chute Length

> 1' Height Between Spillway Crest
& Approach Channel Invert
(Weir Flow)

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

NONE 3 WITHDRAWAL OPENINGS IN STANDPIPE ARE OPEN
(GRAVITY FLOW TO WATER TREATMENT PLANT)

DRAINAGE AREA: 1400 ACRES 2.19 SQ. MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: FOREST & OPEN FIELDS
Terrain - Relief: HILLY ; SLOPES MODERATE ; LARGE WETLANDS @ HEADWATERS
Surface - Soil: PERMEABLE SANDS & GRAVELS

Runoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)

LUTHER FOREST DEVELOPMENT (SECTION II - AFTER 1985)

Potential Sedimentation problem areas (natural or man-made; present or future)

SOILS ARE SUBJECT TO EROSION ; WITH TIME, RESERVOIR AREA
NEAR ELMOR ROBINSON ROAD COULD BECOME SEDIMENT-FILLED

Potential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:

NONE APPARENT ; ELMOR ROBINSON ROAD ELEV. \approx TOP OF DAM
ELEV.

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the
Reservoir perimeter:

Location: NONE APPARENT

Elevation: _____

Reservoir:

Length @ Maximum Pool ± 0.6 (Miles)

Length of Shoreline (@ Spillway Crest) ± 1.5 (Miles)

PROJECT GRID

JOB	MECHANICVILLE RESERVOIR NY-1061	SHEET NO.	1/	CHECKED BY		DATE	
SUBJECT	WATERSHED PARAMETERS			COMPUTED BY	WCL	DATE	4/17/81

DRAINAGE AREA : USGS 7.5 MIN QUAD FOR MECHANICVILLE NY
SCALE: 1" = 2000'
1 SQ IN = 91.827 ACRES

DR AREA = 1400 ACRES ← 15.25 SQ IN
DA = 2.19 SQ MILES

SNYDER UNIT HYDROGRAPH PARAMETERS :

LAG TIME : $t_p = \frac{C}{L} (L \times L)^{0.3}$ $C = 2.5$ (INCREASED C SLIGHTLY to account for upland storage)
 $L = 2.98 \text{ MILES} = 15750'$
 $L_{CA} = 1.18 \text{ MILES} = 6250'$

$t_p = (2.5)(2.98 \times 1.18)^{0.3} = 3.65 \text{ HRS}$

UNIT RAINFALL DURATION : $t_r = \frac{t_p}{5.5}$
 $t_r = 0.66 \text{ HRS}$ USE $t_r = 0.5 \text{ HRS}$ ←

ADJUSTED LAG : $TP = t_p + 0.25(t_r - t_p)$
 $TP = 3.65 + 0.25(0.5 - 0.66)$
 $TP = 3.61 \text{ HRS}$ ←

PEAKING COEFFICIENT :

GAO CP = 400
 $CP = 0.625$ ←

PROJECT GRID

JOB MECHANICVILLE RESV.	SHEET NO. 2/	CHECKED BY	DATE
SUBJECT WATERSHED PARAMETERS		COMPUTED BY WCL	DATE 4/20/81

PMP - RAINFALL :	HRR # 33	
INDEX PRECIPITATION = 19"		
(1200 SQ MI / 24 HR)		
	HRS →	6 12 24 48
@ N 42° 57' } W 73° 43' }	ZONE #1	LOWER LIMIT } OF D-A-D } CURVES }
	% OF INDEX =	111 123 132 142 ←

SOIL INFILTRATION - PRECIP. LOSS RATES:

SOIL TYPES : SANDS & GRAVELS			
SOIL NAME	SCS GROUP	INFILTRATION RATES INS/HR	RATES TYP
COLONIE	A	0.3 - 0.45	0.4
HOOSIC	A	0.3 - 0.45	0.4
HUDSON	C	0.08 - 0.15	0.1

1.0 INS - INITIAL
0.2 INS - CONSTANT
USE
USE

BASE FLOW:

FROM USGS GAGE DATA FOR ANTHONY KILL (INCLUDES PLUM BROOK)
#01335700 WATERSHED

BULL #74	AVE OF 16 READINGS	CSM = 13.45	
	AVE OF 14 "	= 6.67	
	(DELETE 210 & 213 READINGS)		

6 cfs / SQ MI
USE

QRCSN =	-0.1
RTIOR =	1.5

←
←

PROJECT GRID

JOB	MECHANICVILLE RESV.		SHEET NO.	3/	CHECKED BY		DATE	
SUBJECT	ELEVATION - STORAGE CAPACITY				COMPUTED BY	WCL	DATE	4/20/81

FROM 200 SCALE RESV. MAPPING

1 SQ. IN. = 0.91827 ACRES

PLANIMETERED @ 13.09

10.86

NORMAL POOL : 23.95 SQ. INS. → 22 ACRES ← ELEV. @ 263

(ASSUMED POOL = SPILLWAY CREST)

HEIGHT OF DAM (EMBANKMENT) ESTIMATED @ 25' +

STANDPIPE HEIGHT REPORTED AS 33' - BOTTOM RESV. ELEV.

TOP OF EMBANKMENT TO SPILLWAY CREST ≈ 5.5' ← @ 268.5

∴ CONIC VOLUME = $\frac{1}{3} Ah = \frac{(22)(27.5)}{3} = 201 \text{ AC-FT}$ @ NORMAL POOL

VOLUME : ABOVE NORMAL POOL = $22(5.5) = 121 \text{ AC-FT} = \Delta V$ (TO TOP DAM)

TOP OF DAM: VOL = 322 AC-FT

REPORTED VOLUME ≈ 135 MILLION GALS. → 44.1 AC-FT

USGS

USE

PROJECT GRID

JOB MECHANICVILLE RESV.		SHEET NO. 4/	CHECKED BY	DATE
SUBJECT SPILLWAY DISCHARGES - ANALYSIS DATA		COMPUTED BY WCL		DATE 4/23/81
SPILLWAY DIMENSIONS :		TOTAL LENGTH		
OUTER PERIMETER @ 14.9' EACH SIDE		59.6'		
STOPLOG LENGTH @ 12.9' EACH SIDE		51.6'		
12 - 1" Ø PINS / SIDE = 1' EACH SIDE				
STOPLOG LENGTH (NET)		47.6'		WEIR ←
4 PIERS = MASONRY CORNER POST ($K_p = 0.03$)				
SPILLWAY CREST @ 12.25' EACH SIDE		49'		WEIR ←
FLOW CONDITIONS :		CALC. SHT. #		
WEIR FLOW OVER STOPLOGS				9
WEIR FLOW OVER SPILLWAY - NO STOPLOGS				5
ORIFICE (HORIZ) FLOW FOR RCP INLETS				8
CONDUIT FLOW THRU INLETS TO OUTLET STRUCTURE				6
TOP OF DAM (EARTH EMBANKMENT)				
$Q = CLH^{3/2}$		$L = 380'$		
		$C = 2.63$		
(BROAD-CRESTED WEIR)				

PROJECT GRID

JOB MECHANICVILLE RESV.				SHEET NO. 5/		CHECKED BY		DATE	
SUBJECT SPILLWAY DISCHARGES - NO STOPLOGS				COMPUTED BY WCL		DATE 4/23/81			

WEIR FLOW OVER SPILLWAY: $Q = C L H^{3/2}$

$L = 49'$

$C = \text{VARIES W/ } H$

(VERTICAL) $C = 3.2$

REF: DESIGN OF SMALL DAMS
BUREC - 1977
pg. 379

ELEV. C = CREST

$P = 1' +$

(FIG. 25.1)

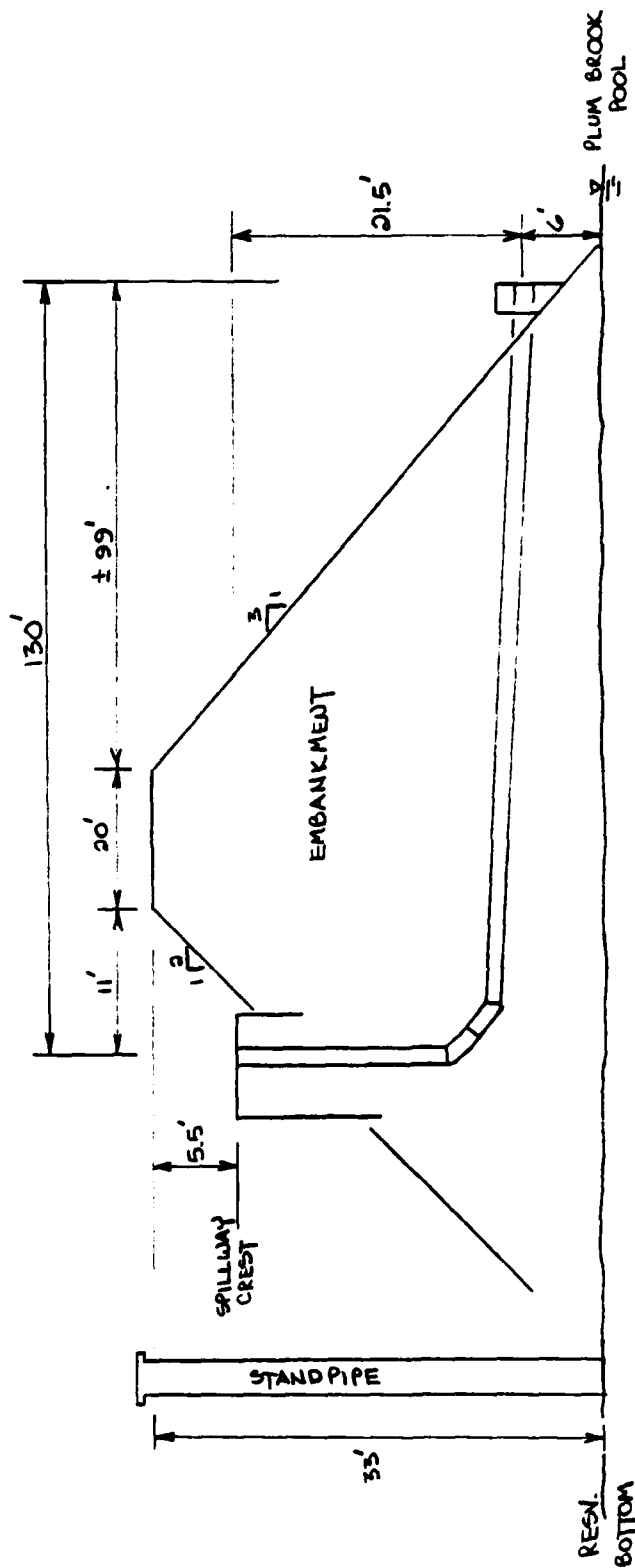
USGS	(RELATIVE) ELEV.	H	P/H	$\frac{C_{HCL}}{C_{VERT}}$	C	Q
263	-0-	-0-	—	—	3.2	—
		0.1	10	0.994	3.18	4.9
		0.2	5	0.994	3.18	13.9
		0.5	2	0.994	3.18	55
		0.75	1.33	0.995	3.18	101
		1	1	0.998	3.19	156
		1.5	0.666	1.005	3.21	289
		1.59	—	—	3.215	316
		1.74	—	—	3.224	363
		2	0.5	1.012	3.24	449
		2.5	0.4	1.017	3.25	629
		3	0.33	1.022	3.27	832
		3.5	0.29	1.025	3.28	1052
TOP POST	3.85	3.85	0.26	1.027	3.28	1214
		4	0.25	1.029	3.29	
		5	0.20	1.034	3.30	
TOP DAM	5.5	5.5	0.18	1.036	3.31	

ORIFICE CONTROL

CONDUIT CONTROL

PROJECT GRID

JOB MECHANICVILLE RESV.		SHEET NO. 6/		CHECKED BY	DATE
SUBJECT SPILLWAY DISCHARGES - CONDUIT FLOW TO OUTLET		COMPUTED BY WCL		DATE 4/24/81	
$Q = A \sqrt{\frac{2gH}{1 + K_b + K_p + K_f L}}$		CONDUIT = STEEL $n = 0.015$ $K_p = 0.0123$ $K_f L = 1.60$ $K_b = \frac{n B}{3}$ $K = 0.225$			
(FOR 30" ϕ) FOR ONE PIPE:		$A = 4.909 \text{ SQ FT}$ $L \approx 130'$ $(\text{SHT } 7')$ $B = 45^\circ$ $K_b = 0.5$			
$Q = 21.604 \sqrt{H_f}$		WHERE $H_f = (H + 21.5)$			
CONC. FLOOR @ +12" BELOW SPILLWAY CREST					
USGS	(RELATIVE) ELEV.	H	H _f	Q	3 PIPES Q
263	-0-	1	22.5	102	306
		1.5	23	103.6	310.8
		1.75	23.25	104.2	312.6
		2	23.5	104.7	314.1
	1.5	2.5	24	105.8	317.4
	1.59	2.59	24.09	106.0	318.0
	2	3	24.5	106.9	320.7
		3.5	25	108	324
	3	4	25.5	109.1	327.3
		4.5	26	110.1	330.3
TOP POST	3.85	4.85	26.35	110.9	332.7
	4	5	26.5	111.2	333.6
	5	6	27.5	113.3	339.9
TOP DAM	5.5	6.5	28	114.3	342.9



EMBANKMENT CROSS-SECTION
(ESTIMATED - NTS)

MECHANICVILLE RESERVOIR DAM
NY - 1061

PROJECT GRID

JOB MECHANICVILLE RESN.				SHEET NO. 8/		CHECKED BY		DATE	
SUBJECT SPILLWAY DISCHARGES - FLOW INTO RCP INLETS NO STOPLOGS				COMPUTED BY WCL		DATE 4/24/81			
ORIFICE FLOW INTO 30" DIAM. DROP INLETS (HORIZ)									
PIPE SOCKET BELOW CONC. FLOOR = 0.33'				C = 0.62					
$Q = CA\sqrt{2gH}$				$A = \frac{\pi D^2}{4} = 4.909 \text{ SQ FT}$					
				FOR 3 PIPES: $A = 14.727 \text{ SQ FT}$					
$Q = 73.274 \sqrt{H}$									
CONC. FLOOR @ ±10" BELOW SPILLWAY CREST (RELATIVE)									
VESS		ELEV.		H		Q		3 PIPES Q	
263		-0-		1		73			
				1.1		76			
				1.2		80		SPILLWAY CREST 240	
				1.5		89		CONTROLS 267	
				1.75		97		291	
		1		2		103		309	
		1.5		2.5		115		345	
		1.74		2.74		121.3		363.9	
		2		3		127		381	
				3.5		137		411	
		3		4		146		438	
				4.5		155		465	
TOP POST		3.85		4.85		161		483	
		4		5		163		489	
		5		6		179		537	
TOP DAM		5.5		6.5		186		558	

PROJECT GRID

JOB MECHANICVILLE RESV.	SHEET NO. 9/	CHECKED BY	DATE
SUBJECT SPILLWAY DISCHARGES - WITH STOPLOGS		COMPUTED BY WCL	DATE 4/24/81

SHARP-CRESTED WEIR FLOW OVER STOPLOGS

$Q = C L H^{3/2}$ $C \propto L$ VARY w/H

(NET) STOPLOGS $L' = 47.6'$ $H = 2.0'$
ELEV. 0 = CREST

WEIR $L = L' - 2(NK_p + K_p)H$ $K_p = 0$

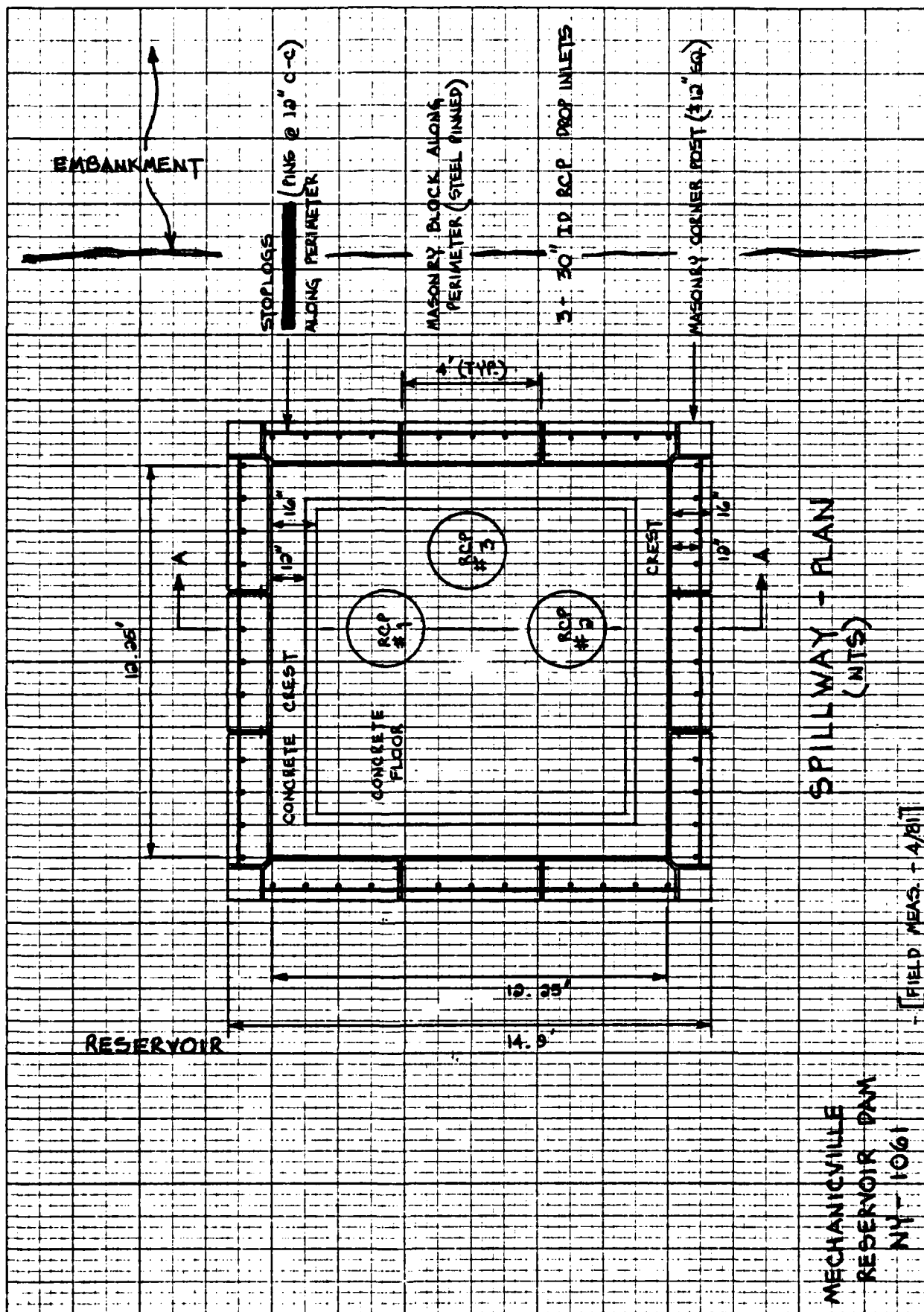
(CORNER POSTS) $N = 4$ $K_p = 0.02$

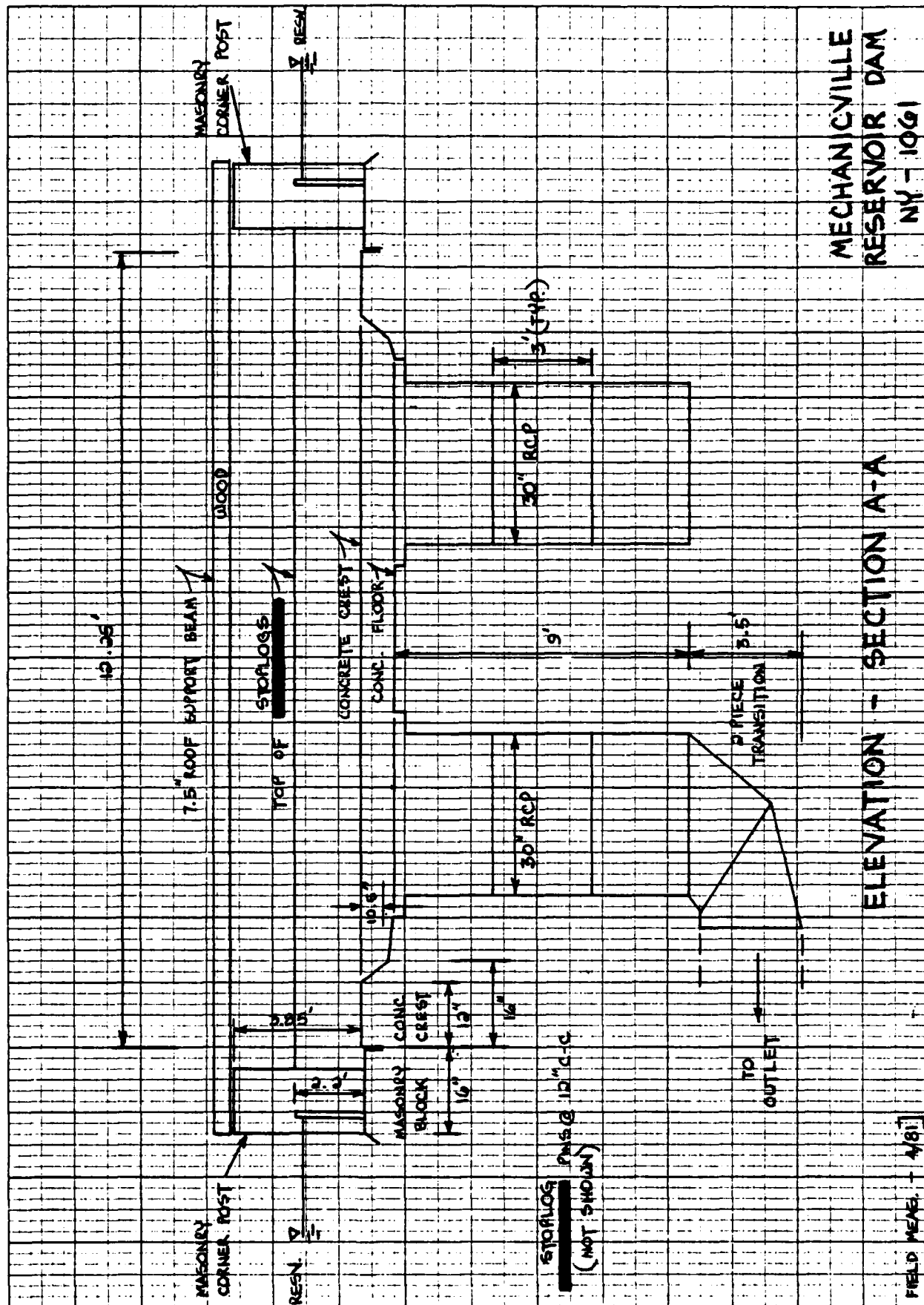
$\therefore L = 47.6 - 0.16H$

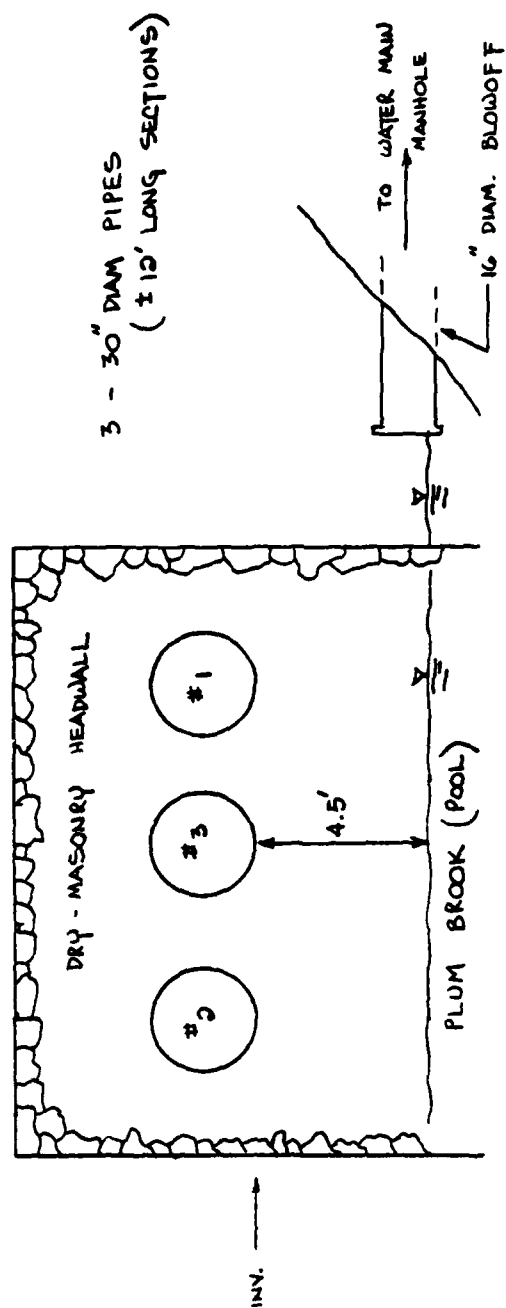
SHARP-CRESTED WEIR w/o END CONTRACTIONS:
C VARIES w/ H/P RATIO

REF:
HANDBOOK OF HYDRAULICS 5TH ED
KINZ & PRATER
FIG. 5-2 (b)

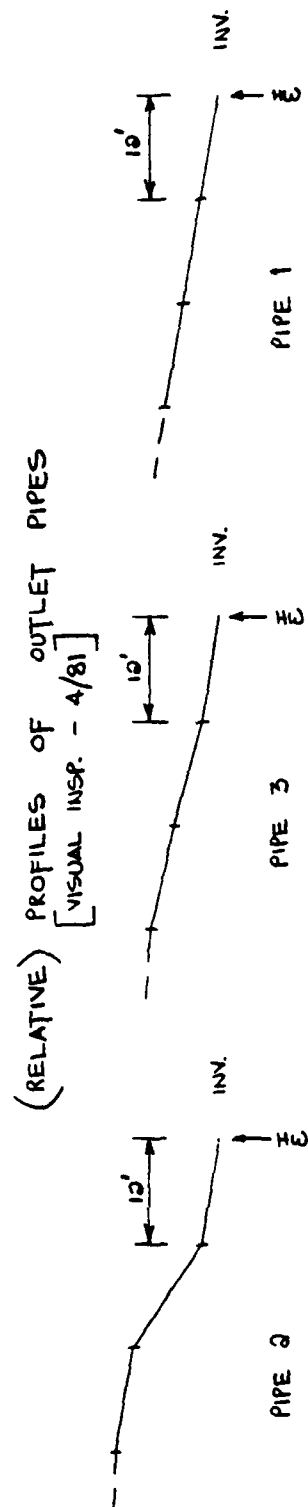
USGS	(RELATIVE)	H	(STOPLOGS)		C	L	Q
	ELEV.		H_B	H_B/P			
263	-0-	-0-	-2.2	—	3.2	47.6	—
		2.2	-0-	—	3.2	47.6	-0-
		2.7	0.5	0.23	3.3	47.52	55
		3	0.8	0.36	3.35	47.47	113
		3.5	1.3	0.59	3.5	47.39	245
TOP POST	3.85	3.85	1.65	0.75	3.55	47.33	356







SPILLWAY OUTLET STRUCTURE

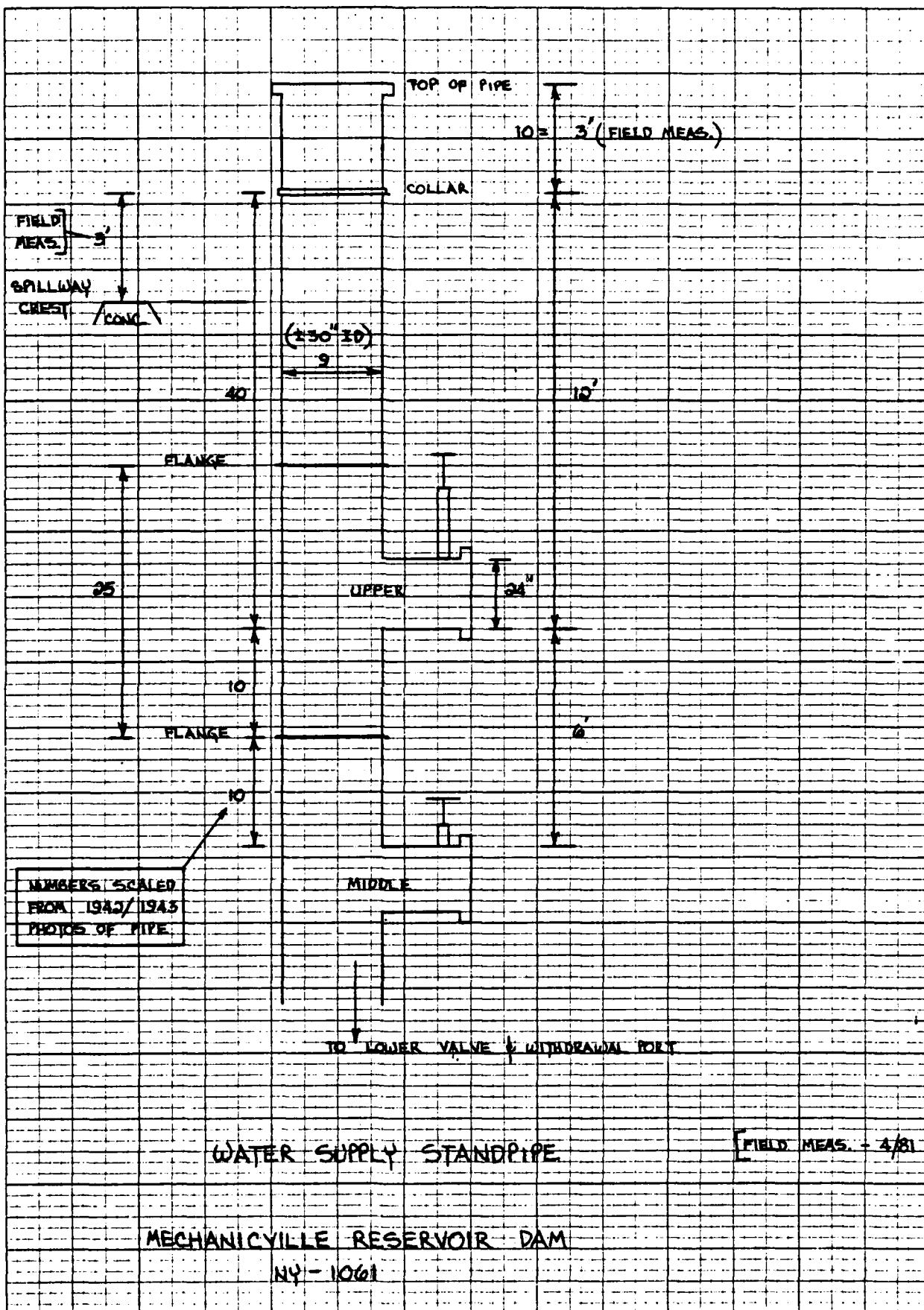


MECHANICVILLE
RESERVOIR DAM

NY-1061

46 0940

12 X 12 TO THE INCH • 7 X 10 IN. H. S.
KLEINFELDER & ASSOCIATES, INC. NEW YORK, N.Y.



DOWNSTREAM CHANNEL :

DAM NAME: MECHANICVILLE RESV.

#: NY-1061

FLOW TIME [REDACTED]

SHEET # 10 /

COMPUTED: $T_c =$ (HRS)

BY: WCL DATE:

MAP: USGS QUAD SHEET - MECHANICVILLE

CHKD: DATE:

[SCS FIG. 15.2]

BLUE LINE) LENGTH	BASE ELEVATION	Δ ELEV.	SLOPE (%)	VELOCITY (fps)	TIME (sec)
(<u> </u>)					
DAM	263	RESV. POOL @ SPILLWAY CREST			
—	235.5	OUTLET POOL			
—	↓				
—	236	PLUM BROOK			
500		6	1.20	1.65	303
—	230				
800		10	1.25	1.69	473
—	220				
1900			0.53	1.1	1727
—	210				
1700			0.59	1.16	1465
—	200				
500		10	2	2.13	235
—	190				
900		30	3.33	2.75	327
—	160				
400		10	2.5	2.4	166
—	150				
500		10	2	2.13	235
—	140				
500 — TO	WATER PLANT	10	1.25	1.69	473
800					
—	130 — LOCAL ROAD				

$\therefore = 8000'$

VELOCITY ≈ 1.5 fps (1.48)

SUBTOTAL: 5404

(1.50 HRS)

PROJECT GRID

JOB MECHANICVILLE RESV.		SHEET NO. 11/	CHECKED BY	DATE
SUBJECT DOWNSTREAM CHANNEL = PLUM BROOK		COMPUTED BY WCL		DATE

REACH # 1 = DAM TO 3200' DNSTRM (EL. 210)		
L = 3200'		
(WTD AVE) SLOPE @ 0.81%		
STREAM:	MAIN CHANNEL	OVERBANK
DEPTH	USE 2'	—
WIDTH	USE 15'	200'
"n" VALUE	USE 0.04	0.04

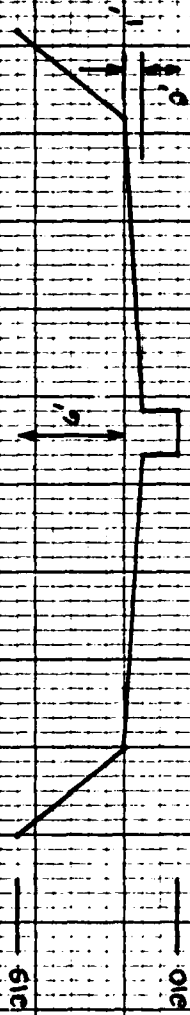
REACH # 2 = CONTOUR 210 DNSTRM TO LOCAL ROAD (GEORGE THOMPSON RD)		
L = 4800'		
(WTD AVE) SLOPE @ 1.67%		
STREAM:	MAIN CHANNEL	OVERBANK
DEPTH	USE 3'	—
WIDTH	USE 15'	100'
"n" VALUE	USE 0.04	0.04

TOTAL REACH = 8000'	
(AVE) SLOPE = $\frac{(23\% - 13\%)}{80}$ = 1.325%	

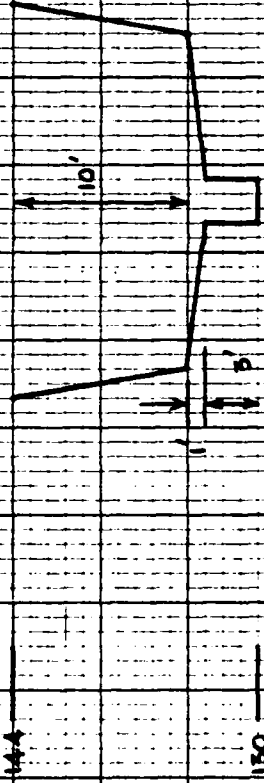
MECHANICVILLE RESERVOIR

PLUM BROOK - DOWNSTREAM CHANNEL

REACH # 1 @ 3200'



REACH # 2 @ 8000'



NY - 1061

DAM: MECHANICVILLE RESERVOIR

SUMMARY OF FLOOD ANALYSIS

By: WCL

Date:

Sht: 13

#	STOPLOGS [REDACTED] OUT	ANALYSIS CONDITIONS:	RATIO	PEAK		OVERTOPPING Depth @ Dam	STA: 32K W.S.Elev.	DOWNSTREAM LOCATION		Inv = 130.0 Flow Depth
				INFLOW	OUTFLOW			Inv = 210.0 Flow Depth	STA: 80K W.S.Elev.	
1	NO BREACH		0.20	634	342	-0-	212.7	2.7	132.9	2.9
			0.21	665	406	0.16	212.8	2.8	133.2	3.2
			0.5	1584	1587	1.15	213.9	3.9	134.8	4.8
			1.0	3168	3171	1.99	214.8	4.8	135.9	5.9
2	BREACH: BOT. EL. 252		0.20	634	342	-0-	212.7	2.7	132.9	2.9
	TFAIL = 0.5 MRS									
	BREACH DEPTH = 16.5'		0.21	665	406	0.16	212.8	2.8	133.2	3.2
	FAILEL = 269.5		0.5	1584	6077	1.11	215.4	5.4	136.5	6.5
			1.0	3168	6534	1.36	215.7	5.7	137.0	7.0
3	BREACH: BOT. EL. 236		0.20	634	342	-0-	212.7	2.7	132.9	2.9
	TFAIL = 2 MRS									
	BREACH DEPTH = 32.5'		0.21	665	406	0.16	212.8	2.8	133.2	3.2
	FAILEL = 269.5		0.5	1584	4663 (4694)	1.11	215.2	5.2	136.4	6.4
			1.0	3168	5575 (5930)	1.36	215.6	5.6	137.0	7.0

By: WCL Date:

SUMMARY OF FLOOD ANALYSIS

DOWNSTREAM LOCATION

ANALYSIS CONDITIONS:

[illegible]

 FLOOD HYDROGRAPH PACKAGE (MC-1)
 DAM SAFETY VERSION JULY 1978
 LAST MODIFICATION 26 FEB 79
 NOCIFLD FOR HONEYWELL APR 79

 NEW YORK STATE
 DEPT OF ENVIRONMENTAL CONSERVATION
 FLOOD PROTECTION BUREAU

1 MECHANICVILLE RESERVOIR DAM
 2 DEC 22EA-142 UH -- PLUM BROOK
 3 CITY WATER SUPPLY
 4 0 30 0 0 0 0 0 0
 5 B1 5
 6 J 1 8 1
 7 J1 0.20 0.21 0.22 0.23 0.24 0.25 0.50 1
 8 K 0 BASIN 1
 9 K1 INFLOW HYDROGRAPH -- DAM
 10 M 1 1 2.19 2.19 1
 11 P 19 111 123 132 142
 12 I 1.0 0.2
 13 W 3.61 0.625
 14 X -6 -0.1 1.5
 15 K 1 DAM 1
 16 K1 ROUTEE OUTFLOW - DAM - SPILLWAY ELEV 263-USGS FLASHBOARDS OUT
 17 Y 1 1 NO BREACH
 18 Y1 1 -263 -1
 19 Y4 263 263.1 263.2 263.5 264.0 264.5 264.59 265.0 265.5 266.0
 20 Y4 266.5 266.85 267.0 268.0 268.5
 21 Y5 0 4.9 13.9 55 156 285 316 320 324 327
 22 Y5 330 332 333 340 343
 23 \$S 201 322
 24 \$E 263 268.5
 25 \$S 263
 26 \$D 268.5 2.63 1.5 380
 27 K 1 32K 1
 28 K1 REACH 1 DAM TO 210
 29 Y 1 1
 30 Y1 1

31 Y6 0.04 0.04 0.04 210 220 3200 0.0081
32 Y7 20 219 50 213 150 212 150 210 165 210

33 Y7 165 212 265 213 295 219

34 K 1 80K 1

35 K1 REACH 2 210 TO 130 LOCAL ROAD

36 Y 1 1

37 Y1 1

38 Y6 0.04 0.04 0.04 130 145 4800 0.0167

39 Y7 90 144 200 134 150 133 150 130 165 130

40 Y7 165 133 215 134 225 144

41 K 99

42 A

43 A

44 A

45 A

46 A

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT BASIN
ROUTE HYDROGRAPH TO DAM
ROUTE HYDROGRAPH TO 32K
ROUTE HYDROGRAPH TO 80K
END OF NETWORK

NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLCDD PROTECTION BUREAU

NY-1061 MECHANICVILLE RESERVOIR DAM
DEC 22 5A-142 UH -- PLUM BROOK
CITY WATER SUPPLY
UPPER HUDSON RIVER BASIN
SARATOGA COUNTY
SNYDER UH

JOB SPECIFICATION									
NO	NHR	NPIA	IDAY	IHR	IMIN	METRC	IPLI	IPRT	NSTAN
200	0	3C	0	0	0	0	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 8 LRTIC= 1
RTIOS= 0.20 0.21 0.22 0.23 0.24 0.25 0.50 1.00

SUR-AREA RUNOFF COMPUTATION									
INFLW	HYDROGRAPH	--	DAM						
ISTAQ	ICOMP	ILECON		ITAPE	JPLI	JPRI	INAME	ISTAGE	IAUIC
EASIN	0	0	0	0	0	0	1	0	0

HYDROGRAPH DATA									
INHDG	IUNG	TAKEA	SNAP	TRSDA	TR:PC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.19	0.	2.19	0.	0.	0	1	0

	P+S	R6	R12	R24	R48	R72	R96
SPFE							
0.	19.00	111.00	123.00	132.00	142.00	0.	0.

LOSS DATA

UNIT HYDROGRAPH DATA
TF= 3.61 CF=0.63 NTA= 0

RECESSION DATA

SIRIO=	-6.00	ORCSA=	-0.10	RTIOR=	1.50
--------	-------	--------	-------	--------	------

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SHYDER CP AND TP ARE TC= 8.20 AND R= 6.53 INTERVALS

END-OF-PERIOD FLOW												
0	HR.MN	PERIOD	RAIN	EXCS	LGSS	COMP Q	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
0	HR.MN	PERIOD	RAIN	EXCS	LGSS	COMP Q	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

NO. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	COMP 0	0. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	COMP 0
1.01	0.30	1	0.00	0.	0.00	13.	1.03	2.30	101	0.	0.	0.	465.
1.01	1.00	2	0.00	0.	0.00	12.	1.03	3.00	102	0.	0.	0.	399.
1.01	1.30	3	0.00	0.	0.00	12.	1.03	3.30	103	0.	0.	0.	342.
1.01	2.00	4	0.00	0.	0.00	11.	1.03	4.00	104	0.	0.	0.	311.
1.01	2.30	5	0.00	0.	0.00	11.	1.03	4.30	105	0.	0.	0.	298.
1.01	3.00	6	0.00	0.	0.00	10.	1.03	5.00	106	0.	0.	0.	286.
1.01	3.30	7	0.00	0.	0.00	10.	1.03	5.30	107	0.	0.	0.	275.
1.01	4.00	8	0.00	0.	0.00	9.	1.03	6.00	108	0.	0.	0.	264.
1.01	4.30	9	0.00	0.	0.00	9.	1.03	6.30	109	0.	0.	0.	254.
1.01	5.00	10	0.00	0.	0.00	9.	1.03	7.00	110	0.	0.	0.	244.
1.01	5.30	11	0.00	0.	0.00	8.	1.03	7.30	111	0.	0.	0.	234.
1.01	6.00	12	0.00	0.	0.00	8.	1.03	8.00	112	0.	0.	0.	225.
1.01	6.30	13	0.01	0.	0.01	8.	1.03	8.30	113	0.	0.	0.	216.
1.01	7.00	14	0.01	0.	0.01	7.	1.03	9.00	114	0.	0.	0.	207.
1.01	7.30	15	0.01	0.	0.01	7.	1.03	9.30	115	0.	0.	0.	199.
1.01	8.00	16	0.01	0.	0.01	7.	1.03	10.00	116	0.	0.	0.	191.
1.01	8.30	17	0.01	0.	0.01	7.	1.03	10.30	117	0.	0.	0.	183.
1.01	9.00	18	0.01	0.	0.01	6.	1.03	11.00	118	0.	0.	0.	176.
1.01	9.30	19	0.01	0.	0.01	6.	1.03	11.30	119	0.	0.	0.	169.
1.01	10.00	20	0.01	0.	0.01	6.	1.03	12.00	120	0.	0.	0.	162.
1.01	10.30	21	0.01	0.	0.01	6.	1.03	12.30	121	0.	0.	0.	156.
1.01	11.00	22	0.01	0.	0.01	5.	1.03	13.00	122	0.	0.	0.	150.
1.01	11.30	23	0.01	0.	0.01	5.	1.03	13.30	123	0.	0.	0.	144.
1.01	12.00	24	0.01	0.	0.01	5.	1.03	14.00	124	0.	0.	0.	138.
1.01	12.30	25	0.06	0.	0.06	5.	1.03	14.30	125	0.	0.	0.	133.
1.01	13.00	26	0.06	0.	0.06	5.	1.03	15.00	126	0.	0.	0.	127.
1.01	13.30	27	0.08	0.	0.08	4.	1.03	15.30	127	0.	0.	0.	122.
1.01	14.00	28	0.08	0.	0.08	4.	1.03	16.00	128	0.	0.	0.	117.
1.01	14.30	29	0.10	0.	0.10	4.	1.03	16.30	129	0.	0.	0.	113.
1.01	15.00	30	0.10	0.	0.10	4.	1.03	17.00	130	0.	0.	0.	108.
1.01	15.30	31	0.12	0.	0.12	4.	1.03	17.30	131	0.	0.	0.	104.
1.01	16.00	32	0.37	0.10	0.27	5.	1.03	18.00	132	0.	0.	0.	100.
1.01	16.30	33	0.09	0.	0.09	8.	1.03	18.30	133	0.	0.	0.	96.
1.01	17.00	34	0.09	0.	0.09	12.	1.03	19.00	134	0.	0.	0.	92.
1.01	17.30	35	0.07	0.	0.07	17.	1.03	19.30	135	0.	0.	0.	88.
1.01	18.00	36	0.07	0.	0.07	22.	1.03	20.00	136	0.	0.	0.	85.
1.01	18.30	37	0.01	0.	0.01	26.	1.03	20.30	137	0.	0.	0.	82.
1.01	19.00	38	0.01	0.	0.01	28.	1.03	21.00	138	0.	0.	0.	78.
1.01	19.30	39	0.01	0.	0.01	28.	1.03	21.30	139	0.	0.	0.	75.
1.01	20.00	40	0.01	0.	0.01	26.	1.03	22.00	140	0.	0.	0.	72.
1.01	20.30	41	0.01	0.	0.01	23.	1.03	22.30	141	0.	0.	0.	69.
1.01	21.00	42	0.01	0.	0.01	20.	1.03	23.00	142	0.	0.	0.	67.
1.01	21.30	43	0.01	0.	0.01	17.	1.03	23.30	143	0.	0.	0.	64.
1.01	22.00	44	0.01	0.	0.01	15.	1.04	0.	144	0.	0.	0.	61.
1.01	22.30	45	0.01	0.	0.01	15.	1.04	0.30	145	0.	0.	0.	59.
1.01	23.00	46	0.01	0.	0.01	11.	1.04	1.00	146	0.	0.	0.	57.
1.01	23.30	47	0.01	0.	0.01	10.	1.04	1.30	147	0.	0.	0.	54.
1.02	0.	48	0.01	0.	0.01	9.	1.04	2.00	148	0.	0.	0.	52.
1.02	0.30	49	0.05	0.	0.05	8.	1.04	2.30	149	0.	0.	0.	50.
1.02	1.00	50	0.05	0.	0.05	7.	1.04	3.00	150	0.	0.	0.	48.
1.02	1.30	51	0.05	0.	0.05	6.	1.04	3.30	151	0.	0.	0.	46.
1.02	2.00	52	0.05	0.	0.05	5.	1.04	4.00	152	0.	0.	0.	44.
1.02	2.30	53	0.05	0.	0.05	5.	1.04	4.30	153	0.	0.	0.	43.
1.02	3.00	54	0.05	0.	0.05	4.	1.04	5.00	154	0.	0.	0.	41.
1.02	3.30	55	0.05	0.	0.05	4.	1.04	5.30	155	0.	0.	0.	39.
1.02	4.00	56	0.05	0.	0.05	3.	1.04	6.00	156	0.	0.	0.	38.
1.02	4.30	57	0.05	0.	0.05	3.	1.04	6.30	157	0.	0.	0.	36.
1.02	5.00	58	0.05	0.	0.05	3.	1.04	7.00	158	0.	0.	0.	34.

1.02	6.30	61	0.15	0.15	0.10	5.	1.04	8.30	161	0.	0.	31.
1.02	7.00	62	0.15	0.15	0.10	5.	1.04	9.00	162	0.	0.	30.
1.02	7.30	63	0.15	0.15	0.10	9.	1.04	9.30	163	0.	0.	28.
1.02	8.00	64	0.15	0.15	0.10	16.	1.04	10.00	164	0.	0.	27.
1.02	8.30	65	0.15	0.15	0.10	26.	1.04	10.30	165	0.	0.	26.
1.02	9.00	66	0.15	0.15	0.10	38.	1.04	11.00	166	0.	0.	25.
1.02	9.30	67	0.15	0.15	0.10	50.	1.04	11.30	167	0.	0.	24.
1.02	10.00	68	0.15	0.15	0.10	63.	1.04	12.00	168	0.	0.	23.
1.02	10.30	69	0.15	0.15	0.10	75.	1.04	12.30	169	0.	0.	22.
1.02	11.00	70	0.15	0.15	0.10	86.	1.04	13.00	170	0.	0.	21.
1.02	11.30	71	0.15	0.15	0.10	94.	1.04	13.30	171	0.	0.	21.
1.02	12.00	72	0.15	0.15	0.10	102.	1.04	14.00	172	0.	0.	20.
1.02	12.30	73	0.84	0.74	0.10	117.	1.04	14.30	173	0.	0.	19.
1.02	13.00	74	0.84	0.74	0.10	153.	1.04	15.00	174	0.	0.	18.
1.02	13.30	75	1.01	0.91	0.10	221.	1.04	15.30	175	0.	0.	17.
1.02	14.00	76	1.01	0.91	0.10	329.	1.04	16.00	176	0.	0.	17.
1.02	14.30	77	1.27	1.17	0.10	481.	1.04	16.30	177	0.	0.	16.
1.02	15.00	78	1.27	1.17	0.10	675.	1.04	17.00	178	0.	0.	15.
1.02	15.30	79	1.54	1.44	0.10	906.	1.04	17.30	179	0.	0.	15.
1.02	16.00	80	4.87	4.77	0.10	1207.	1.04	18.00	180	0.	0.	14.
1.02	16.30	81	1.18	1.08	0.10	1586.	1.04	18.30	181	0.	0.	14.
1.02	17.00	82	1.18	1.08	0.10	1995.	1.04	19.00	182	0.	0.	13.
1.02	17.30	83	0.93	0.83	0.10	2399.	1.04	19.30	183	0.	0.	13.
1.02	18.00	84	0.93	0.83	0.10	2762.	1.04	20.00	184	0.	0.	12.
1.02	18.30	85	0.07	0.	0.07	3031.	1.04	20.30	185	0.	0.	12.
1.02	19.00	86	0.07	0.	0.07	3168.	1.04	21.00	186	0.	0.	11.
1.02	19.30	87	0.07	0.	0.07	3161.	1.04	21.30	187	0.	0.	11.
1.02	20.00	88	0.07	0.	0.07	2998.	1.04	22.00	188	0.	0.	10.
1.02	20.30	89	0.07	0.	0.07	2733.	1.04	22.30	189	0.	0.	10.
1.02	21.00	90	0.07	0.	0.07	2439.	1.04	23.00	190	0.	0.	10.
1.02	21.30	91	0.07	0.	0.07	2138.	1.04	23.30	191	0.	0.	9.
1.02	22.00	92	0.07	0.	0.07	1848.	1.05	0.	192	0.	0.	9.
1.02	22.30	93	0.07	0.	0.07	1586.	1.05	0.30	193	0.	0.	8.
1.02	23.00	94	0.07	0.	0.07	1361.	1.05	1.00	194	0.	0.	8.
1.02	23.30	95	0.07	0.	0.07	1167.	1.05	1.30	195	0.	0.	8.
1.03	0.	96	0.07	0.	0.07	1001.	1.05	2.00	196	0.	0.	7.
1.03	0.30	97	0.	0.	0.	859.	1.05	2.30	197	0.	0.	7.
1.03	1.00	98	0.	0.	0.	737.	1.05	3.00	198	0.	0.	7.
1.03	1.30	99	0.	0.	0.	632.	1.05	3.30	199	0.	0.	7.
1.03	2.00	100	0.	0.	0.	542.	1.05	4.00	200	0.	0.	6.

SUM 21.58 16.40 5.19 52239.
(548.3) (416.3) (132.3) (1479.24)

FEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2521.	98'	359.	52236.
CMS	71.	21.	10.	1479.
INCHES	10.71	16.77	18.32	18.49
MM	272.02	425.16	465.38	469.56
AC-FT	1250.	155'	2139.	2158.
THOUS CU M	1542.	241''	2638.	2662.

HYDROGRAPH AT STA HASIN FOR PLAN 1, RATIO 1

3.	2.	2.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	4.	5.	6.	5.

19. 20. 21. 31. 44. 66. 96. 135. 181. 241.

317.	399.	480.	552.	606.	634.	632.	600.	547.	488.
428.	370.	317.	272.	233.	200.	172.	147.	126.	108.
93.	80.	68.	62.	40.	57.	55.	51.	49.	49.
47.	45.	42.	41.	40.	38.	37.	35.	34.	32.
31.	30.	29.	28.	27.	25.	24.	23.	22.	22.
21.	20.	19.	18.	18.	17.	16.	16.	15.	14.
14.	13.	12.	12.	12.	11.	11.	10.	10.	10.
9.	9.	8.	8.	8.	8.	7.	7.	7.	6.
6.	6.	5.	5.	5.	5.	5.	5.	4.	4.
4.	4.	4.	4.	3.	3.	3.	3.	3.	3.
3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME

CFS 504. 197. 72. 10445.
 CMS 14. 11. 2. 296.
 INCHES 2.14 3.35 3.66 3.70
 PM 54.40 85.7 93.08 93.91
 AC-FT 250. 39.2 428. 432.
 THOUS CU M 308. 48.1 528. 532.

HYDROGRAPH AT STA BASIN FOR PLAN 1, RTIO 2

3.	3.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	3.	4.	5.	6.	6.	5.	5.
5.	4.	4.	3.	3.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	3.	5.	8.	11.	13.	16.	18.
20.	21.	24.	32.	47.	69.	101.	142.	150.	253.
333.	419.	504.	580.	637.	665.	665.	630.	574.	512.
449.	388.	333.	286.	245.	210.	180.	155.	133.	114.
98.	84.	72.	65.	63.	60.	58.	55.	53.	51.
49.	47.	45.	43.	42.	40.	39.	37.	36.	34.
33.	31.	30.	29.	28.	27.	26.	25.	24.	23.
22.	21.	20.	19.	19.	18.	17.	16.	16.	15.
15.	14.	13.	13.	12.	12.	11.	11.	11.	10.
10.	9.	9.	8.	8.	8.	7.	7.	7.	7.
6.	6.	6.	6.	6.	5.	5.	5.	5.	4.
4.	4.	4.	4.	4.	4.	3.	3.	3.	3.
3.	3.	3.	3.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME

CFS 665. 297. 75. 10967.
 CMS 19. 6. 2. 311.
 INCHES 2.25 3.52 3.85 3.88
 PM 57.12 89.43 97.73 98.61
 AC-FT 263. 411. 449. 453.
 THOUS CU M 324. 507. 559. 559.

HYDROGRAPH AT STA BASIN FOR PLAN 1, RTIO 3

3.	3.	3.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

2.	11.	2.	10.	1.	5.	2.	7.	6.	13.	5.	14.	4.	15.
3.	1.	3.	2.	2.	2.	2.	2.	2.	2.	2.	2.	1.	1.
47.	51.	51.	77.	58.	111.	131.	151.	165.	240.	337.	453.	58.	43.
793.	997.	1195.	1381.	1515.	1584.	1584.	1584.	1584.	1584.	1499.	1366.	1219.	604.
1069.	924.	792.	640.	584.	501.	429.	368.	316.	271.	222.	181.	141.	101.
232.	159.	171.	155.	149.	143.	127.	112.	85.	54.	36.	24.	16.	11.
117.	112.	108.	104.	99.	95.	88.	81.	74.	67.	60.	53.	46.	39.
78.	75.	72.	69.	66.	64.	61.	59.	56.	54.	51.	48.	45.	42.
52.	50.	48.	46.	44.	42.	41.	39.	38.	36.	34.	32.	30.	28.
35.	33.	32.	31.	29.	28.	27.	26.	25.	24.	23.	22.	21.	20.
23.	22.	21.	20.	20.	19.	18.	17.	16.	15.	14.	13.	12.	11.
15.	15.	14.	14.	13.	13.	12.	12.	11.	10.	9.	8.	7.	6.
10.	10.	9.	9.	9.	8.	8.	8.	7.	6.	5.	4.	3.	2.
7.	7.	6.	6.	6.	6.	5.	5.	5.	4.	3.	2.	1.	0.
5.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.

PLAN 1
RATIO 7

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
1584.	1261.	49.	180.	26113.
45.	36.	14.	5.	739.
	5.35	8.38	9.16	9.24
	136.01	212.93	232.69	234.78
	625.	979.	1061.	1079.
	771.	1207.	1319.	1331.

CFS
CMS
INCHES
MM
AC-FT
THOUS CU M

HYDROGRAPH AT STA BASIN FOR PLAN 1, RATIO 8

13.	8.	6.	4.	2.	1.	11.	10.	10.	9.	9.
1586.	1995.	117.	153.	221.	329.	481.	675.	906.	1207.	1586.
2138.	1848.	2395.	2762.	3031.	3168.	3161.	2998.	2733.	2439.	2138.
465.	399.	342.	311.	298.	286.	275.	264.	254.	244.	234.
234.	225.	216.	207.	199.	191.	183.	176.	169.	162.	150.
150.	150.	144.	138.	133.	127.	122.	117.	113.	108.	100.
109.	100.	96.	92.	88.	85.	82.	78.	75.	72.	69.
69.	67.	64.	61.	59.	57.	54.	52.	50.	48.	46.
46.	44.	42.	41.	39.	38.	36.	35.	32.	30.	28.
31.	30.	28.	27.	26.	25.	24.	23.	22.	21.	20.
21.	20.	19.	18.	17.	17.	16.	15.	14.	13.	12.
14.	13.	12.	12.	12.	11.	11.	10.	10.	10.	9.
9.	9.	8.	8.	8.	7.	7.	7.	7.	6.	5.

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
2168.	2521.	987.	359.	52226.
90.	71.	26.	10.	1479.
	10.71	16.77	18.32	18.49
	272.02	425.16	465.38	469.56
	1250.	1951.	2139.	2158.
	1542.	2414.	2638.	2662.

CFS
CMS
INCHES
MM
AC-FT
THOUS CU M

ROUTED QLTFLOW - DAM - SPILLWAY ELEV 263-USGS		FLASHBOARDS OUT						
ISTAQ	ICOMP	TECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
DAM	1	0	0	0	0	1	0	0

	GROSS	CLOSE	Avg	IRES	ROUTING DATA ISAM:	IOPT	IPMP	LSTP	
	0.	0.	0.	1		0	0	0	
		NSTFS	NSIDL	LAG	ANSKK	X	ISK	STORA	ISPRAI
		1	0	0	0.	0.	-1	-263.	
STAGE	263.00	263.10	263.20	263.50	264.00	264.50	265.00	265.50	266.00
	266.50	267.85	269.00	268.00	268.50				
FLOW	0.	4.50	13.90	55.00	156.00	289.00	320.00	324.00	327.00
	330.00	332.10	333.00	340.00	343.00				

Capacity	201.	222.
CAPACITY=	201.	222.

ELEVATION= 263. 269.

CREL	SFWD	COQH	EXPU	FLEV	CJOL	CAREA	EXPL
263.0	0.	0.	0.	0.	0.	0.	0.

DIM DATA		
TYPEL	COQD	EXPD • DAMWD
268.5	2.0	1.5 380.

STATION CAN, PLAN 1, RATIC 1

END-OF-PERIOD HYDROGRAPH ORDINATES

[illegible]

STORAGE:

49.03	105.42	116.19	117.16
225.	487.	534.	538.
278.	600.	658.	664.

END-CF-PERIOD HYDROGRAPH ORDINATES

STORAGE

STAGE

[illegible]

263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1
263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1	263.2	263.1

PEAK OUTFLOW IS 1587. AT TIME 43.50 HOURS

PLAN 1
RATIO 7

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
1587.	1170.	492.	180.	26071.
45.	33.	14.	5.	738.
	4.97	8.35	9.15	
	126.20	212.2	232.44	234.40
	580.	975.	1068.	1077.
	715.	1203.	1318.	1329.

THOUS CU M

STATION DAM, PLAN 1, RATIO 8
END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1.	2.	3.	4.	5.	6.	7.
7.	7.	8.	7.	7.	7.	7.
7.	6.	6.	6.	6.	6.	5.
5.	5.	5.	7.	5.	11.	17.
20.	20.	19.	18.	17.	15.	14.
11.	10.	9.	8.	7.	6.	5.
5.	5.	5.	8.	12.	19.	27.
57.	70.	83.	127.	175.	269.	326.
623.	1953.	2260.	2966.	3143.	3171.	3050.
2223.	1934.	1667.	1235.	1064.	917.	791.

511.	336.	330.	353.	343.	342.	341.
337.	317.	274.	221.	187.	164.	150.
320.	317.	274.	221.	187.	164.	150.
119.	114.	109.	104.	100.	95.	88.
78.	75.	72.	69.	66.	63.	61.
53.	51.	45.	48.	46.	44.	43.
36.	35.	34.	32.	31.	30.	29.
24.	23.	22.	22.	21.	20.	19.
16.	16.	15.	14.	14.	13.	13.
11.	11.	11.	10.	10.	10.	9.

STORAGE

201.	202.	203.	204.	205.	206.	207.
204.	204.	204.	204.	204.	204.	204.
203.	203.	203.	203.	203.	203.	203.
206.	206.	206.	206.	206.	206.	206.
205.	205.	205.	205.	205.	205.	205.
203.	203.	203.	203.	203.	203.	203.
212.	214.	215.	217.	220.	225.	232.
331.	352.	356.	361.	364.	366.	365.
355.	352.	346.	345.	342.	340.	337.
325.	327.	325.	323.	321.	319.	317.
302.	298.	292.	288.	283.	277.	271.
246.	239.	231.	228.	225.	224.	222.
219.	218.	218.	217.	217.	216.	216.
214.	214.	214.	213.	213.	213.	212.
212.	211.	211.	211.	211.	210.	210.

36.	35.	34.	33.	32.	31.	30.	29.	28.	27.
16.	16.	15.	14.	14.	14.	13.	13.	13.	12.
11.	11.	11.	10.	10.	10.	10.	9.	9.	8.

201.	202.	203.	204.	205.	206.	207.	208.	209.	210.
204.	204.	204.	204.	204.	204.	204.	204.	204.	204.
204.	204.	204.	203.	203.	203.	203.	203.	203.	203.
203.	203.	203.	203.	203.	204.	204.	205.	206.	206.
206.	206.	206.	206.	206.	206.	206.	206.	205.	205.
205.	205.	204.	204.	204.	204.	204.	203.	203.	203.
203.	203.	203.	204.	204.	204.	205.	206.	208.	209.
331.	332.	356.	361.	361.	364.	366.	366.	365.	359.
355.	352.	346.	345.	345.	342.	340.	337.	335.	331.
329.	327.	325.	323.	323.	321.	315.	317.	314.	307.
302.	299.	291.	288.	288.	283.	277.	271.	265.	252.
246.	239.	231.	228.	228.	226.	224.	222.	220.	215.
219.	218.	216.	217.	217.	217.	216.	216.	216.	212.
214.	214.	214.	213.	213.	213.	213.	213.	212.	209.
212.	211.	211.	211.	211.	211.	210.	210.	210.	207.
209.	209.	205.	208.	208.	208.	208.	208.	208.	206.
207.	207.	207.	207.	206.	206.	206.	206.	206.	205.
206.	206.	206.	205.	205.	205.	205.	205.	205.	204.
205.	205.	205.	205.	205.	204.	204.	204.	204.	204.

STORAGE

263.0	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

STAGE

PEAK OUTFLOW IS 3171. AT TIME 43.51 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
2171.	2509.	981.	359.	52165.
90.	71.	28.	10.	1477.
CFS	CM	CM	CM	CM
INCHES	INCHES	INCHES	INCHES	INCHES
	10.66	16.68	18.31	18.46

MM
AC-FT
THOUS CU M

469.01
2156.
2659.

MM 270.67 423.55 465.07 469.01
AC-FT 1244. 1947. 2137. 2156.
THOUS CU M 1534. 2401. 2637. 2659.

HYDROGRAPH ROUTING

REACH 1 DAM TO 210
ISTAO ICOMP IECON ITAPE JPLT JPRT INANE ISTAGE IAUJO
32K 1 0 0 0 0 1 0
ROUTING DATA
GROSS CLOSS AVG IRES ISAME IOPT IPMP LSTR
0. 0. 0. 1 1 0 0
NSTES NSTOL LAG AMSKK X ISK SIORA ISPRAT
1 0 0 0. 0. 0.

NORMAL DEPTH CHANNEL ROUTING

QN(1) QN(2) QN(3) ELNVT ELMAX RLNTH SEL
0.0400 0.0400 0.0400 210.0 220.0 3200. 0.00810

CROSS SECTION COORDINATES--STA-ELEV, STA-ELEV--ETC

20.00 219.00 50.00 213.00 150.00 212.00 150.00 210.00 165.00 210.00
165.00 212.00 265.00 213.00 295.00 219.00

	STORAGE	0.	48.28	57.57	1.16	67.06	76.76	1.74	2.40	5.83	13.15	21.62	30.31	39.15
CUTFLOW	0.	16.49	5714.83	7248.36	50.18	7248.36	8938.16	54.79	119.07	277.48	624.39	1260.50	2104.40	3135.65
STAGE	210.00	215.26	215.79	216.32	216.84	217.37	217.89	218.42	218.95	219.47	220.00	220.53	221.06	221.59
FLOW	0.	16.49	5714.83	7248.36	50.18	7248.36	8938.16	54.79	119.07	277.48	624.39	1260.50	2104.40	3135.65

STATION 32K, PLAN 1, RATIO 1

OUTFLOW

	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
OUTFLOW	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
OUTFLOW	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.

MAXIMUM STORAGE = 7.

MAXIMUM STAGE IS 212.7

STATION 32K, PLAN 1, RTIO 2

OUTFLOW

[illegible]

STOR

[illegible]

[illegible][illegible][illegible]

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFS	392.	351.	206.	75.		10944.
CMS	11.	10.	6.	2.		310.
INCHES		1.49	3.50	3.84		310.
MM		37.89	89.0	97.55		98.40
AC-FT		174.	409.	448.		452.
THOUS CU M		215.	504.	551.		558.

MAXIMUM STORAGE = 8.

MAXIMUM STAGE IS 212.8

STATION 32K, PLAN 1, RTIO 3[illegible]

STATION 32K, PL411, RTIO.8

OUTFLOW

1.	1.	2.	3.	4.	5.	6.	7.
7.	7.	7.	8.	8.	7.	7.	7.
7.	7.	6.	6.	6.	6.	5.	5.
5.	5.	5.	5.	6.	10.	14.	17.
20.	20.	20.	19.	18.	16.	15.	13.
12.	11.	10.	9.	9.	7.	6.	6.
5.	5.	5.	5.	7.	14.	33.	43.
53.	68.	75.	94.	113.	216.	322.	330.
477.	1445.	2341.	2518.	2944.	3182.	2866.	2579.
2285.	1999.	1734.	1489.	1283.	963.	716.	620.
551.	479.	418.	372.	338.	342.	340.	339.
338.	337.	335.	334.	332.	329.	326.	324.
322.	319.	296.	251.	210.	160.	134.	128.
121.	115.	110.	105.	101.	93.	85.	82.
79.	76.	72.	70.	67.	62.	57.	55.
53.	51.	50.	48.	47.	43.	40.	39.
37.	36.	34.	33.	32.	29.	27.	26.
25.	24.	22.	22.	21.	19.	18.	17.
17.	16.	16.	15.	14.	13.	13.	12.
12.	11.	11.	11.	10.	10.	9.	9.

STOR

0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	2.	2.	3.	4.	7.	7.
10.	24.	32.	34.	38.	40.	37.	34.
32.	29.	26.	24.	22.	18.	14.	13.
12.	10.	9.	8.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	6.	5.	4.	3.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.

STAGE

210.0	210.0	210.1	210.1	210.1	210.2	210.2	210.2
210.2	210.2	210.2	210.2	210.2	210.2	210.2	210.2
210.2	210.2	210.2	210.2	210.2	210.2	210.2	210.2
210.6	210.6	210.6	210.6	210.6	210.5	210.4	210.4
210.4	210.4	210.3	210.3	210.3	210.2	210.2	210.2
210.2	210.2	210.2	210.2	210.2	210.6	210.8	210.5
211.1	211.2	211.4	211.6	211.8	212.4	212.7	212.7
212.9	213.8	214.3	214.6	214.7	214.8	214.6	214.5
214.3	214.1	214.0	213.8	213.7	213.3	213.2	213.2
213.0	212.9	212.8	212.8	212.7	212.7	212.7	212.7

MAXIMUM STAG 15 214.8

HYDROGRAPH ROUTING

REACH 2 210 TO 130 LOCAL ROAD
 ISIAO ICOPP IFCON ITAPE JPLT JPRT INAME ISTAGE IAUTC
 8CK 1 0 0 0 0 0 0 0 0
 ROUTING DATA
 GLCSS CLOSS AVG INES ISAME IOPT IFMP LSTR
 0. 0. 0. 10000 10000 0 0 0 0
 NSTFS NSTDL LAG ANSKC X ISK SICRA ISPRAY
 1 0 0 0. 0. 0. 0. 0. 0.

NORMAL DEPTH CHANNEL ROUTING

QN(1) QN(2) QN(3) ELNWT ELMAX RLNTH SEL
 0.0400 0.0400 0.0400 130.0 145.0 4800. 0.01670

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
 90.00 44.00 100.00 114.10 150.00 133.00
 165.00 133.00 215.00 114.00 225.00 144.00

STORAGE	0.	1.30	2.61	3.91	5.36	11.47	21.52	31.72	42.06	52.32
	63.15	73.50	84.79	95.81	106.57	118.27	129.71	141.29	152.99	164.74
OUTFLOW	0.	45.55	136.10	253.06	393.29	700.11	1452.39	2544.23	3918.43	5545.97
	7407.37	9488.41	11778.12	14267.76	16950.21	19819.58	22870.89	26099.92	29577.90	33447.61
STAGE	130.00	130.75	131.58	132.37	133.16	133.95	134.74	135.52	136.32	137.11
	137.89	138.68	139.47	140.26	141.05	141.84	142.63	143.42	144.21	145.00

FLOW	0.	45.55	136.10	253.06	393.29	700.11	1452.39	2544.23	3918.43	5545.97
	7407.37	9488.41	11778.12	14267.76	16950.21	19819.58	22870.89	26099.92	29577.90	33447.61

STATION 80K, PLAN 1, R110.1

OUTFLOW	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
	0.	1.	1.	1.	1.	1.	1.	1.	1.	1.
	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
	197.	197.	197.	197.	197.	197.	197.	197.	197.	197.
	340.	341.	342.	341.	340.	338.	336.	334.	331.	328.
	329.	326.	321.	319.	312.	303.	295.	287.	279.	271.
	70.	63.	57.	54.	51.	48.	45.	42.	39.	36.

MECHANICVILLE RESERVOIR DAM NY - 1061

NO BREACH

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FORMULIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS									
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8		
				0.20	0.21	0.22	0.23	0.24	0.25	0.50	1.00		
HYDROGRAPH AT	RASIN	2.19 (2540.71)	1	634. (17.94)	665. (19.84)	697. (19.73)	729. (20.63)	760. (21.53)	792. (22.42)	1584. (44.85)	3168. (89.69)		
ROUTED TO	DAM	2.19 (2540.71)	1	342. (9.67)	406. (11.49)	494. (14.00)	573. (16.23)	620. (17.56)	701. (19.85)	1587. (44.94)	3171. (89.79)		
ROUTED TO	32K	2.19 (2540.71)	1	342. (9.67)	392. (11.10)	471. (13.34)	551. (15.61)	617. (17.47)	684. (19.38)	1587. (44.94)	3182. (90.10)		
ROUTED TO	80K	2.19 (2540.71)	1	342. (9.67)	394. (11.15)	472. (13.36)	529. (14.98)	603. (17.08)	643. (18.20)	1587. (44.94)	3153. (89.30)		

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 INITIAL VALUE SPILLWAY CREST TOP OF DAM
 ELEVATION 263.00 263.00 268.50
 STORAGE 201. 201. 322.
 CUTFLOW 0. 0. 343.

RATIO OF F.F.	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM CUTFLOW CFS	DURATION ONR TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.20	268.27	317.	342.	0.	46.50	0.
0.21	268.66	325.	406.	2.00	46.00	0.
0.22	268.78	328.	494.	2.50	45.50	0.
0.23	268.87	330.	573.	3.00	45.00	0.
0.24	268.92	331.	620.	3.50	45.00	0.
0.25	269.00	333.	701.	4.00	44.50	0.
0.50	265.65	347.	1587.	8.00	43.50	0.
1.00	270.45	366.	3171.	12.00	43.50	0.

PLAN 1 STATION 32K

RATIO	MAXIMUM FLOW, CFS	MAXIMUM STAGE, FT	TIME HOURS
0.20	342.	212.7	46.50
0.21	352.	212.8	46.00
0.22	471.	212.9	46.00
0.23	551.	213.0	45.50
0.24	617.	213.1	45.00
0.25	684.	213.2	45.00
0.50	1587.	213.9	43.00
1.00	3182.	214.8	43.50

PLAN 1 STATION 80K

RATIO	MAXIMUM FLOW, CFS	MAXIMUM STAGE, FT	TIME HOURS
0.20	342.	132.9	46.50
0.21	394.	133.2	46.50
0.22	472.	133.4	46.00
0.23	529.	133.5	45.50
0.24	603.	133.7	45.50
0.25	643.	133.8	45.50
0.50	1587.	134.8	43.00
1.00	3153.	135.9	43.50

MECHANICVILLE RESERVOIR DAM
 NY - 1061

NO BREACH

FLOQUE HYDROGRAPHIC PACKAGE (HEC-1)
CAN SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

MODIFIED FOR HONEYWELL APPS 79

NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU

[illegible]

UPPER HUCSON RIVER BASIN
SARATOGA COUNTY
SNYDER UN

MECHANICVILLE RESERVOIR DAM
DEC 25A-142 UN -- PLUM BROOK
CITY WATER SUPPLY

A1	AY-1061
A2	
A3	
B	200
B1	5

—

1

1

INFLOW HYDROGRAPH -- DAM

1

142

1.0 0.2

25

1.5.

AM

FLASHBOARDS OUTLINE

I

1

5.592 266.0

in

327

3

2

521

2

20

0
1
1
)
-
3
3
)
1
3
0
3
3
3

1

[illegible]

NEW YORK STATE
DEPT OF ENVIRONMENTAL CONSERVATION
FLOOD PROTECTION BUREAU

04-Y-1001 MECHANICVILLE RESERVOIR DAM
 DEC 22-A-142 UH -- PLUM BROOK
 CITY WATER SUPPLY
 UPPER HUDSON RIVER BASIN
 SARATOGA COUNTY
 SNYDER UH

JOB SPECIFICATION

IS	NHS	NPIN	ICAY	IHR	IMIN	MEIRC	IPLT	IPRT	NSTAN
200	0	50	0	0	0	0	0	0	0
			JOPER	NWT	LROPT	IRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED:

RTIOS=	0.20	0.21	0.22	0.23	0.24	0.25	0.50	1.00
NPLAN= 1 VRTIO= 8 LRTIO= 1								

SUB-AREA RUNOFF COMPUTATION

INFLW HYDROGRAPH -- DAY
ISYQ ICORP IECOV
BASIN 0

HYDROGRAPH DATA

IHYOG	IUHG	TAFEA	SNAP	TRSDA	TRSPC	RATIO	TSWOW	ISANE	LOCAL
1	1	2.19	0.	2.19	0.	0.	0	1	0

PRECIP DATA

	SPFE	PFS	RG	R12	R24	R48	R72	R96
0	15.00	111.00	123.00	132.00	142.00	0	0	0

IN SPICE COMPUTED BY THE PROGRAM IS 0.800

LOSS DATA

LROPT	STRKR	DLTKR	RTICK	ERATN	STAKS	RTICK	STRTL	CNSTL	ALSNX	RTIMP
0	0.	0.	1.00	0.	0.	1.00	1.00	0.20	0.	0.

UNIT HYDROGRAPHIC DATA

IP= 3.61 CP=0.51 NTA= 0

REFERENCE DATA

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE: $CC = 8.20$ AND $RC = 0.33$ INTERVALS

UNIT HYDROGRAPH 59 ENC-OF-PERIOD ORIGINATES. I AG= 3.58 HOURS, CP= 0.63 VOL= 1.00

12.	45.	85.	139.	188.	226.	247.	250.	231.	199.
71.	145.	126.	109.	92.	79.	68.	58.	50.	43.
32.	32.	27.	23.	20.	17.	15.	13.	11.	9.
8.	7.	6.	5.	4.	4.	3.	3.	2.	2.

ENGINEERING - PERIOD FLOW

HO.CA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	HO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
-------	-------	--------	------	------	------	--------	-------	-------	--------	------	------	------	--------

THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.010 HOURS DURING BREACH FORMATION. DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 0.00 HOURS. THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH. INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

**PLAN 1
RATIO 2**

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	COMPUTED BREACH HYDROGRAPH (CFS)	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-F)
45.500	0.000	279.	379.	0.	0.	0.
45.510	0.010	474.	407.	57.	57.	0.
45.520	0.020	509.	443.	126.	193.	0.
45.530	0.030	665.	488.	177.	370.	0.
45.540	0.040	760.	529.	221.	591.	0.
45.550	0.050	855.	596.	260.	851.	1.
45.560	0.060	951.	657.	294.	1144.	1.
45.570	0.070	1046.	722.	324.	1468.	1.
45.580	0.080	1141.	792.	350.	1818.	2.
45.590	0.090	1236.	865.	372.	2189.	2.
45.600	0.100	1332.	941.	390.	2580.	2.
45.610	0.110	1427.	1022.	405.	2985.	2.
45.620	0.120	1522.	1109.	414.	3398.	3.
45.630	0.130	1618.	1201.	416.	3815.	3.
45.640	0.140	1713.	1297.	416.	4231.	3.
45.650	0.150	1808.	1395.	414.	4647.	4.
45.660	0.160	1903.	1495.	409.	5053.	4.
45.670	0.170	1999.	1597.	402.	5455.	5.
45.680	0.180	2094.	1701.	393.	5848.	5.
45.690	0.190	2190.	1807.	382.	6230.	5.
45.700	0.200	2285.	1914.	370.	6601.	5.
45.710	0.210	2380.	2023.	357.	6958.	6.
45.720	0.220	2475.	2133.	343.	7300.	6.
45.730	0.230	2570.	2243.	327.	7628.	6.
45.740	0.240	2666.	2355.	311.	7939.	7.
45.750	0.250	2751.	2467.	284.	8233.	7.
45.760	0.260	2836.	2579.	257.	8511.	7.
45.770	0.270	2921.	2692.	229.	8770.	7.
45.780	0.280	3007.	2805.	202.	9012.	7.
45.790	0.290	3092.	2918.	174.	9236.	8.
45.800	0.300	3177.	3031.	146.	9443.	8.
45.810	0.310	3263.	3144.	119.	9631.	8.
45.820	0.320	3348.	3257.	93.	9803.	8.
45.830	0.330	3433.	3369.	64.	9957.	8.
45.840	0.340	3519.	3481.	38.	10095.	8.
45.850	0.350	3604.	3592.	12.	10216.	8.
45.860	0.360	3689.	3703.	106.	10322.	9.
45.870	0.370	3774.	3813.	91.	10414.	9.
45.880	0.380	3859.	3922.	78.	10491.	9.
45.890	0.390	3944.	4030.	65.	10556.	9.
45.900	0.400	4029.	4138.	53.	10609.	9.
45.910	0.410	4114.	4244.	42.	10650.	9.
45.920	0.420	4200.	4349.	32.	10682.	9.
45.930	0.430	4285.	4453.	23.	10705.	9.
45.940	0.440	4370.	4556.	15.	10720.	9.
45.950	0.450	4455.	4658.	9.	10729.	9.
45.960	0.460	4540.	4758.	4.	10734.	9.
45.970	0.470	4625.	4856.	1.	10735.	9.

AD-A105 847

NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. MECHANICVILLE RESERVOIR DAM (INVEN-ETC(U)
AUG 81 G KOCH DACW51-79-C-0001

UNCLASSIFIED

NL

2 of 2
Pages



END

DATE

FILED

4 1 81

DTIC

[illegible]

41

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	586.	1563.	542.	195.	2833.
CMS	170.	44.	15.	6.	80.
INCPES		6.56	9.22	9.36	10.04
MM		169.15	234.06	253.07	254.92
AC-FT	777.		1076.	1163.	1172.
THOUS CU M		959.	1327.	1435.	1445.

THE CAN BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.010 HOURS DURING BREACH FORMATION.
 DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 0.500 HOURS.
 THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
 INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

PLAN 1
RATIO 7

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	COMPUTED BREACH HYDROGRAPH (CFS)	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FI)
42-000	0.	1004.	1004.	0.	0.	0.
42-010	0.010	1104.	1078.	26.	26.	0.
42-020	0.020	1204.	1145.	59.	84.	0.
42-030	0.030	1303.	1216.	87.	172.	0.
42-040	0.040	1403.	1290.	113.	285.	0.
42-050	0.050	1503.	1365.	137.	422.	0.
42-060	0.060	1602.	1442.	160.	582.	0.
42-070	0.070	1702.	1520.	181.	764.	1.
42-080	0.080	1802.	1599.	202.	966.	1.
42-090	0.090	1901.	1678.	223.	1189.	1.
42-100	0.100	2001.	1757.	244.	1433.	1.
42-110	0.110	2100.	1836.	264.	1697.	1.
42-120	0.120	2200.	1915.	285.	1982.	2.
42-130	0.130	2300.	1994.	306.	2288.	2.
42-140	0.140	2399.	2073.	327.	2614.	2.
42-150	0.150	2499.	2151.	348.	2962.	2.
42-160	0.160	2599.	2230.	369.	3331.	3.
42-170	0.170	2698.	2308.	390.	3721.	3.
42-180	0.180	2798.	2387.	411.	4132.	3.
42-190	0.190	2897.	2466.	431.	4564.	4.
42-200	0.200	2977.	2546.	451.	5015.	4.
42-210	0.210	3077.	2626.	470.	5485.	5.
42-220	0.220	3136.	2708.	488.	5974.	5.
42-230	0.230	3296.	2792.	504.	6478.	5.
42-240	0.240	3396.	2878.	518.	6995.	6.
42-250	0.250	3495.	2967.	528.	7523.	6.
42-260	0.260	3595.	3060.	534.	8058.	7.
42-270	0.270	3694.	3160.	534.	8592.	7.
42-280	0.280	3794.	3260.	525.	9117.	8.
42-290	0.290	3894.	3399.	495.	9612.	8.
42-300	0.300	3993.	3531.	462.	10074.	8.
42-310	0.310	4093.	3663.	429.	10503.	9.
42-320	0.320	4193.	3795.	397.	10900.	9.
42-330	0.330	4292.	3927.	365.	11266.	9.
42-340	0.340	4392.	4057.	335.	11601.	10.
42-350	0.350	4491.	4187.	304.	11905.	10.
42-360	0.360	4591.	4316.	275.	12180.	10.
42-370	0.370	4691.	4444.	247.	12427.	10.
42-380	0.380	4790.	4571.	220.	12647.	10.
42-390	0.390	4890.	4696.	194.	12840.	11.
42-400	0.400	4990.	4821.	163.	13009.	11.
42-410	0.410	5089.	4944.	145.	13154.	11.
42-420	0.420	5189.	5066.	123.	13277.	11.
42-430	0.430	5288.	5186.	102.	13379.	11.
42-440	0.440	5388.	5305.	83.	13462.	11.
42-450	0.450	5488.	5423.	65.	13526.	11.
42-460	0.460	5587.	5539.	48.	13575.	11.
42-470	0.470	5687.	5653.	34.	13609.	11.
42-480	0.480	5787.	5766.	21.	13629.	11.
42-490	0.490	5886.	5877.	10.	13639.	11.
42-500	0.500	5986.	5986.	0.	13639.	11.

STATION DAM, PLAN 1, RATIO H

END-OF-PERIOD HYDROGRAPH ORIGINATES

STORAGE

STAGE

[illegible]

PLAN 1
RATIO 8

124.	124.	124.	124.	124.	124.	124.	124.	124.	124.
123.	123.	123.	123.	123.	123.	123.	123.	123.	123.
122.	122.	122.	122.	122.	122.	122.	122.	122.	122.
121.	121.	121.	121.	121.	121.	121.	121.	121.	121.
121.	121.	121.	121.	121.	121.	121.	121.	121.	120.

STAGE									
263.0	263.0	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
263.2	263.2	263.2	263.2	263.2	263.2	263.2	263.2	263.2	263.2
263.2	263.2	263.2	263.2	263.2	263.2	263.2	263.2	263.2	263.2
263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1	263.1
263.5	263.6	263.6	263.7	263.9	264.1	264.4	265.0	265.8	267.2

268.9	266.2	260.5	260.6	261.3	261.7	261.7	261.5	261.1	260.5
259.9	259.2	258.6	256.0	257.5	257.0	256.5	256.1	255.7	255.4
255.1	254.8	254.5	254.3	254.2	254.1	254.1	254.0	254.0	253.9
253.9	253.8	253.8	253.7	253.7	253.6	253.6	253.6	253.5	253.5
253.4	253.4	253.4	253.3	253.3	253.3	253.2	253.2	253.2	253.1
253.1	253.1	253.1	253.0	253.0	253.0	252.9	252.9	252.9	252.9
252.9	252.8	252.8	252.8	252.8	252.7	252.7	252.7	252.7	252.7
252.7	252.6	252.6	252.6	252.6	252.6	252.6	252.5	252.5	252.5
252.5	252.5	252.5	252.5	252.5	252.4	252.4	252.4	252.4	252.4
252.4	252.4	252.4	252.4	252.3	252.3	252.3	252.3	252.3	252.3
252.3	252.3	252.3	252.3	252.3	252.3	252.3	252.2	252.2	252.2
252.2	252.2	252.2	252.2	252.2	252.2	252.2	252.2	252.2	252.2

PEAK OUTFLOW IS 6214. AT TIME 41.00 HOURS

PEAK				TOTAL VOLUME			
6214.	2865.	1035.	375.	5434.			
176.	81.	29.	11.	1540.			
	12.18	17.50	19.10	19.25			
	309.26	446.98	485.20	488.96			
	1421.	2054.	2230.	2247.			
	1753.	2534.	2751.	2772.			

CFS
CMS
INCHES
MN
AC-FT
THOUS CU M

THE LEAK BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF 0.010 HOURS DURING BREACH FORMATION. DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 0.000 HOURS. THIS TABLE COMPARES THE HYDROGRAPH FOR INSTANTANEOUS CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH. INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

PLAN 1
RATIO 8

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	COMPUTED BREACH HYDROGRAPH (CFS)	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-F)
40.500	0.	631.	631.	0.	0.	0.
40.510	0.010	743.	713.	29.	29.	0.
40.520	0.020	854.	796.	58.	88.	0.
40.530	0.030	966.	886.	80.	168.	0.
40.540	0.040	1078.	980.	98.	266.	0.
40.550	0.050	1189.	1077.	112.	378.	0.
40.560	0.060	1301.	1177.	124.	502.	0.
40.570	0.070	1413.	1279.	134.	636.	1.
40.580	0.080	1524.	1382.	143.	778.	1.
40.590	0.090	1636.	1485.	151.	929.	1.
40.600	0.100	1748.	1588.	160.	1089.	1.
40.610	0.110	1859.	1690.	169.	1258.	1.
40.620	0.120	1971.	1792.	179.	1437.	1.
40.630	0.130	2083.	1893.	189.	1626.	1.
40.640	0.140	2194.	1994.	201.	1827.	2.
40.650	0.150	2306.	2093.	213.	2040.	2.
40.660	0.160	2418.	2191.	226.	2266.	2.
40.670	0.170	2529.	2289.	241.	2507.	2.
40.680	0.180	2641.	2385.	256.	2762.	2.
40.690	0.190	2753.	2481.	272.	3034.	3.
40.700	0.200	2864.	2576.	288.	3322.	3.
40.710	0.210	2976.	2671.	305.	3626.	3.
40.720	0.220	3088.	2766.	321.	3948.	3.
40.730	0.230	3199.	2861.	338.	4286.	4.
40.740	0.240	3311.	2957.	354.	4639.	4.
40.750	0.250	3422.	3054.	368.	5007.	4.
40.760	0.260	3534.	3153.	381.	5388.	4.
40.770	0.270	3646.	3255.	391.	5779.	5.
40.780	0.280	3757.	3361.	397.	6176.	5.
40.790	0.290	3869.	3472.	397.	6573.	5.
40.800	0.300	3981.	3586.	384.	6957.	6.
40.810	0.310	4092.	3706.	386.	7314.	6.
40.820	0.320	4204.	3829.	375.	7642.	6.
40.830	0.330	4316.	3954.	362.	7944.	7.
40.840	0.340	4427.	4081.	346.	8219.	7.
40.850	0.350	4539.	4210.	329.	8467.	7.
40.860	0.360	4651.	4341.	312.	8691.	7.
40.870	0.370	4763.	4473.	290.	8890.	7.
40.880	0.380	4874.	4608.	264.	9066.	7.
40.890	0.390	4986.	4746.	240.	9219.	8.
40.900	0.400	5097.	4887.	210.	9352.	8.
40.910	0.410	5209.	5030.	183.	9464.	8.
40.920	0.420	5321.	5175.	154.	9558.	8.
40.930	0.430	5432.	5322.	126.	9635.	8.
40.940	0.440	5544.	5470.	94.	9696.	8.
40.950	0.450	5656.	5619.	61.	9743.	8.
40.960	0.460	5767.	5767.	23.	9777.	8.
40.970	0.470	5879.	5916.	-14.	9801.	8.
40.980	0.480	5990.	6064.	-64.	9814.	8.
40.990	0.490	6102.	6214.	-112.	9820.	8.
41.000	0.500	6214.	6214.	0.	9820.	8.

REACH 1 CAP TO 210

ISIAQ	ICOMP	IECON	ITAPE	JPLT	JPRF	INAME	ISTAGE	IAUTC
32K	1	0	0	0	0	1	0	0
ROUTING DATA								
DLOSS	AVG	IRIS	ISAME	ICRF	IPMP		LSTR	
0.	0.	1	1	0	0		0	
NSIFS	ASIDL	LAG	AMSKK	X	TSK	SFORA	ISPRAT	
1	0	0	0.	0.	0.	0.	0	

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
84

Q(1)	Q(2)	Q(3)	ELNVT	ELMAX	RLNTH	SCL
0.0400	0.0400	0.0400	210.C	220.C	3200.	0.00810

20.00	219.00	50.00	213.10	150.00	212.00	150.00	210.00	165.00	210.00
165.00	212.00	265.00	213.10	295.00	219.00				

STORAGE	0.	0.58	1.16	1.74	2.40	5.83	13.15	21.62	30.31	53.15
	49.28	57.57	67.06	76.76	86.66	96.76	107.07	117.58	128.21	138.84

OUTFL77	0.	16.49	50.18	74.79	149.07	277.48	624.39	1260.50	2104.40	3135.59
	4341.95	5714.83	7248.36	8938.15	10780.95	12774.26	14916.23	17209.48	19839.00	22546.21

STAGE	210.00	210.53	211.05	211.58	212.11	212.53	213.16	213.68	214.21	214.74
	215.26	215.79	216.32	216.84	217.37	217.89	218.42	218.95	219.47	220.00

FLOW	0.	16.49	50.18	74.79	149.07	277.48	624.39	1260.50	2104.40	3135.59
	4341.95	5714.83	7248.36	8938.16	10780.95	12774.26	14916.23	17209.48	19839.00	22546.21

CUTFLOW

[illegible]

HYDROGRAPH ROUTING

REACH 2 210 TO 130 LOCAL ROAD
 ISTAO ICOMP IFCON ITAPE JPLI JPRT INAME ISTAGE IAUIC
 80K 1 0 0 0 0 0 1 0 0
 ROUTING DATA
 QLOSS CLOSS AVG IRES ISAME IOPI IPMP LSTR
 0. 0. 10000 10000 0 0 0 0
 NSTFS NSTDL LAG ANSKK X TSK STORA ISPRAY
 1 0 0 0. 0. 0. 0. 0. 0.

NORMAL DEPTH CHANNEL ROUTING

ON(1) ON(2) ON(3) ELNVI ELMAX RLNTH SEL
 0.0400 0.0400 0.0400 130.0 145.0 4800. 0.01670

CROSS SECTION COORDINATES--STA,ELFV,STA,ELEV--ETC.

90.00 144.00 200.00 134.00 150.00 133.00 150.00 165.00 130.00 130.00
 165.00 133.00 215.00 134.00 225.00 144.00

STORAGE	0.	1.30	2.61	3.91	5.36	11.47	21.52	31.72	42.06	52.32
	63.15	73.50	84.79	95.81	106.97	118.27	129.71	141.29	152.99	164.74
CUIFLOW	0.	45.55	136.10	253.06	393.29	700.11	1452.39	2544.23	3918.43	5545.47
	7407.37	9488.41	11778.12	14267.76	15950.21	19819.58	22870.89	26099.93	29577.90	33447.61
STAGE	130.00	130.79	131.58	132.37	133.16	133.95	134.74	135.53	136.32	137.11
	137.89	138.68	139.47	140.26	141.05	141.84	142.63	143.42	144.21	145.00
FLOW	0.	45.55	136.10	253.06	393.29	700.11	1452.39	2544.23	3918.43	5545.47
	7407.37	9488.41	11778.12	14267.76	15950.21	19819.58	22870.89	26099.93	29577.90	33447.61

STATION 80K, PLAIN 1, RTIO 1

OUTFLOW										
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
5.	7.	10.	13.	18.	27.	40.	66.	103.	152.	221.
145.	197.	256.	310.	323.	328.	331.	335.	338.	341.	344.
340.	341.	342.	341.	341.	338.	336.	334.	331.	328.	325.
329.	326.	323.	319.	312.	303.	295.	288.	281.	274.	267.
70.	63.	57.	54.	51.	46.	43.	41.	39.	37.	35.
39.	38.	36.	35.	32.	31.	29.	28.	27.	26.	25.
26.	25.	24.	23.	22.	21.	20.	19.	18.	17.	16.

PEAK FLOW AND STORAGE (EAD OF PERIOD) SUMMARY FORMULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
 AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS							
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8
HYDROGRAPH AT	HASIN	2.19 (2682.47)	1	0.20	0.21	0.22	0.23	0.24	0.25	0.50	1.00
				(17.54)	(18.84)	(19.73)	(20.63)	(21.53)	(22.42)	(44.83)	(89.69)
ROUTED TO	DAM	2.19 (2682.47)	1	342.	5143.	5231.	5296.	5352.	5397.	5985.	6214.
				(9.67)	(125.64)	(148.13)	(149.56)	(151.54)	(152.84)	(165.50)	(175.95)
ROUTED TO	32K	2.19 (2682.47)	1	342.	3499.	3618.	3655.	3834.	3766.	4571.	4474.
				(9.67)	(99.08)	(102.44)	(103.51)	(108.58)	(106.65)	(125.45)	(126.69)
ROUTED TO	80K	2.19 (2682.47)	1	342.	3258.	3356.	3442.	3482.	3573.	4418.	5049.
				(9.67)	(92.25)	(95.04)	(97.47)	(98.59)	(101.17)	(125.10)	(142.98)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

ELEVATION STORAGE CUTFLOW INITIAL VALUE SPILLWAY CRIST TCP OF DAM
263.06 201. 0. 263.00 268.50
201. 322.
0. 343.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM CUTFLOW CFS	DURATION OVER TOF HOURS	TIME OF MAX OUTFLOW HOURS	TYPE OF FAILURE HOURS
0.20	268.27	0.11	317.	342.	0.	46.50	C.
0.21	268.61	0.22	324.	5143.	0.61	46.00	45.50
0.22	268.72	0.22	327.	5231.	0.65	45.50	45.00
0.23	268.72	0.22	327.	5236.	0.66	45.00	44.50
0.24	268.91	0.41	331.	5352.	1.19	45.00	44.50
0.25	268.75	0.29	328.	5397.	0.58	44.50	44.00
0.50	269.26	0.76	339.	5986.	0.78	42.50	42.00
1.00	269.12	0.62	336.	6214.	0.79	41.00	40.50

PLAN 3 STATION 32K

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.20	342.	212.7	46.50
0.21	3499.	214.9	46.00
0.22	3618.	214.9	45.50
0.23	3655.	215.0	45.00
0.24	3834.	215.0	45.00
0.25	3766.	215.0	44.50
0.50	4571.	215.4	42.50
1.00	4474.	215.3	41.00

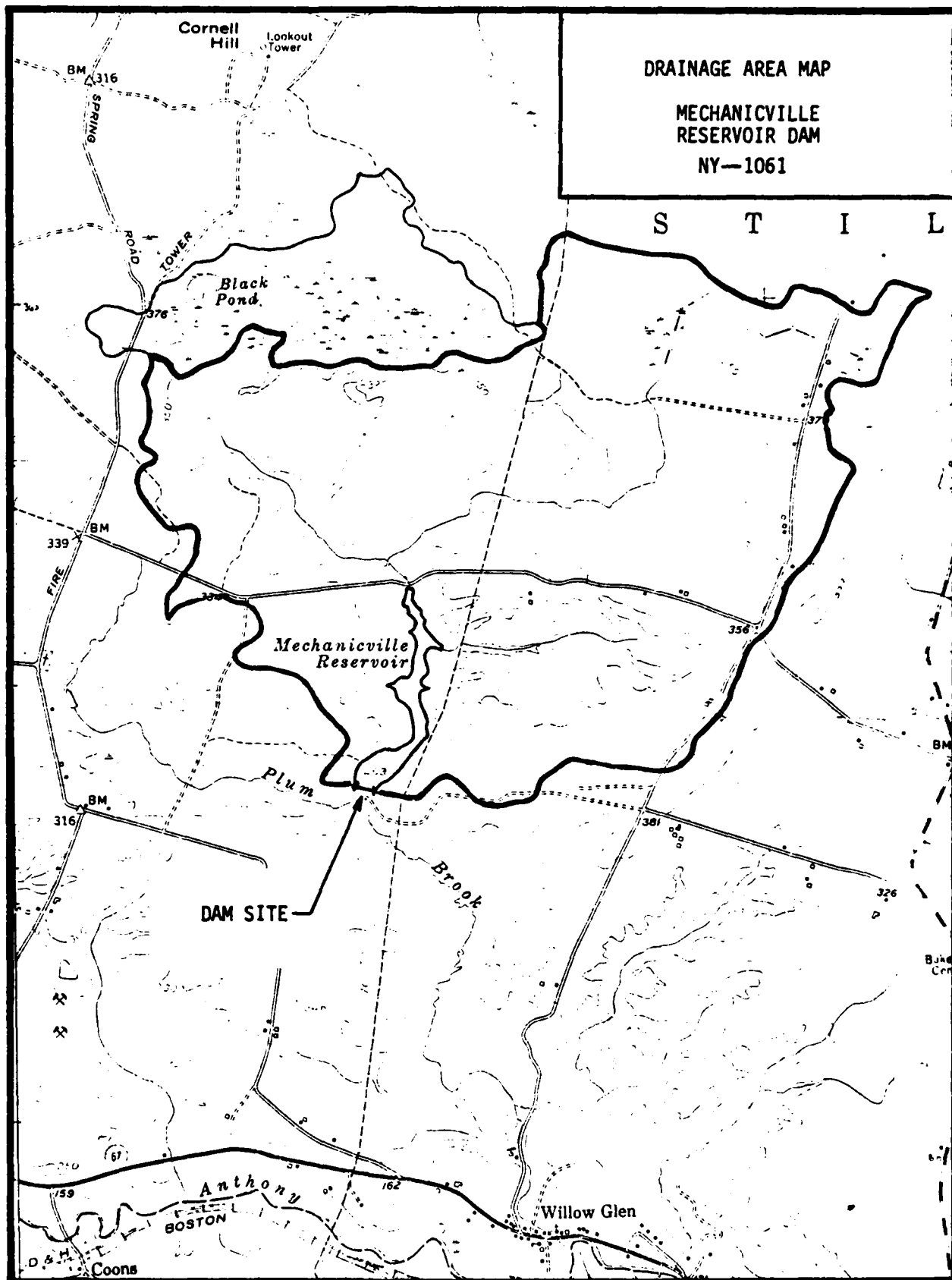
PLAN 1 STATION 80K

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
0.20	342.	132.9	46.50
0.21	3258.	133.9	46.50
0.22	3346.	136.0	46.00
0.23	3442.	136.0	45.50
0.24	3482.	136.1	45.50
0.25	3573.	136.1	45.00
0.50	4418.	136.5	43.00
1.00	5049.	136.9	41.50

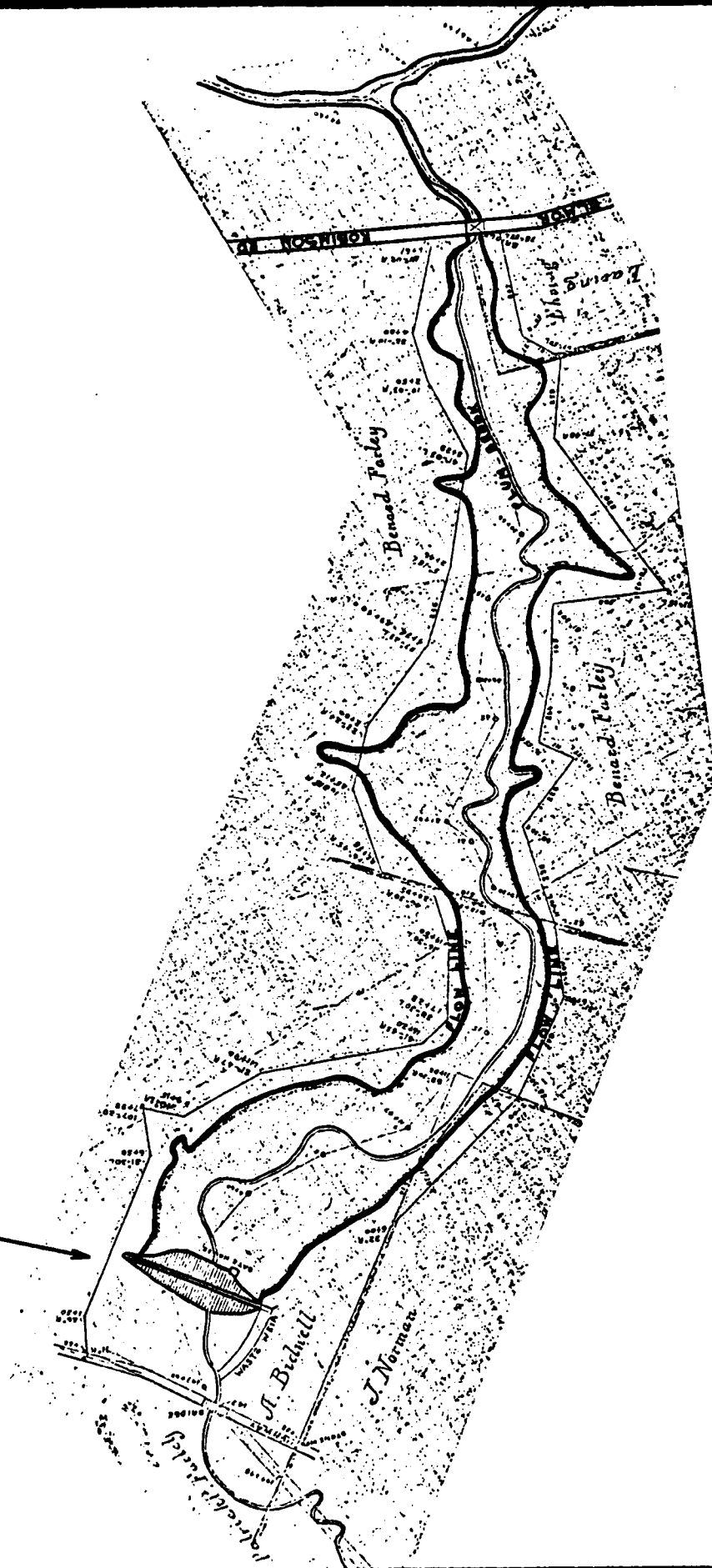
MECHANICVILLE RESERVOIR DAM

NY - 1061

WITH BREACH



DAM SITE



Discharge measurements made at low-flow partial-record stations during water year 1961--Continued

Discharge measurements made at 100-plus partial-record stations during water year 1961.

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Hudson River basin -- Continued						
3287	Moses Kill near Fort Miller, N. Y.	Lat 43°12'12", long 73°33'06", at bridge on county highway, 3.2 miles northeast of Fort Miller.	37.9	1956-61	8- 2-61	3.72
3293	White Creek near Salem, N. Y.	Lat 43°09'07", long 73°21'18", at bridge on town road, 2.1 miles southwest of Salem.	48.6	1956-61	8- 9-61	8.11
3348	Owl Kill at Eagle Bridge, N. Y.	Lat 42°57'08", long 73°22'57", at bridge upstream from bridge on State Highway 67, at Eagle Bridge.	56.4	1911, 1956-61	7- 7-61 8-14-61	14.8 8.28
3357	Anthony Kill at Mechanicville, N.Y.	Lat 42°55'05", long 73°42'53", at 4th Highway bridge above State Highway 146, 1.8 miles above mouth at Mechanicville.	62.4	1956-61	8- 9-61	19.5
*3358	Mohawk River at Hillside, N. Y.	Lat 43°21'18", long 75°23'02", at bridge on Webster Hill road, 100 ft upstream from Lansing Kill, at Hillside.	48.8	1956-61	7-11-61	25.9
3380	Oriskany Creek near Oriskany, N. Y.	Lat 43°08'36", long 75°20'17", at bridge on county highway, 1.1 miles south of Oriskany.	145	1901-44, 1955, 1960-61	7-12-61 8-18-61	92.9 56.9
3388	Sauquoit Creek at New Hartford, N. Y.	Lat 43°04'28", long 75°17'12", at bridge on State Highways 5 and 12, at New Hartford.	43.4	1955-56, 1958-61	8- 9-61	29.9
3427	Moyer Creek at Frankfort, N. Y.	Lat 43°02'30", long 75°04'18", at bridge on State Highway 5-S, at Frankfort.	21.8	1954, 1956-61	8- 9-61	5.93
3427.9	South Branch West Canada Creek near Morehouseville, N.Y.	Lat 43°23'59", long 74°44'30", at bridge on Martin's Mountain Home Road, 0.3 mile downstream from Wilmurt Lake Outlet, 0.35 mile north of State Highway 8, 1.7 miles northeast of Morehouseville, and 5½ miles upstream from mouth.	40.2	1961	7-11-61 7-11-61 9-15-61 9-28-61	26.2 25.1 20.6 4.10
*3428	West Canada Creek at Nobleboro, N. Y.	Lat 43°23'47", long 74°51'35", at bridge on State Highway 8, at Nobleboro.	192	1956-57, 1959-61	7-11-61 9-28-61	134 43.2
3472	East Canada Creek at Emmonsburg, N. Y.	Lat 43°09'14", long 74°42'45", at bridge on County Highway 104, at Emmonsburg.	101	1956-61	8-10-61	36.9
3492	Canajoharie Creek at Canajoharie, N. Y.	Lat 42°54'19", long 74°34'18" at foot bridge near intersection of Hill and Mill Streets, at Canajoharie.	68.4	1949-50, 1956-61	8- 8-61	8.16
3496	Schoharie Creek near Hunter, N. Y.	Lat 42°11'31", long 74°10'52", at bridge on State Highway 214, 2.4 miles southeast of Hunter.	29.2	1957-61	9-25-61	8.12
3497	East Kill near Jewett Center, N. Y.	Lat 42°14'57", long 74°18'11", at bridge on Lexington-Jewett highway, 1.2 miles northeast of Jewett Center, and 1.3 miles above mouth.	35.2	1955-61	9-25-61	3.08
3498	West Kill at West Kill, N. Y.	Lat 42°12'42", long 74°23'16", at bridge on State Highway 42, at West Kill.	21.2	1956-61	9-25-61	3.35
3499	Batavia Kill near Ashland, N. Y.	Lat 42°17'36", long 74°18'19", at bridge on Ashland-Jewett highway, 0.2 mile south State Highway 23, 1.6 miles southeast of Ashland.	51.2	1955-61	9-25-61	4.50

* Also a crest-stage partial-record station.

† Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at low-flow partial-record stations during water year 1962--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Hudson River basin						
*3199.3	Sand Lake Outlet near Piseco, N. Y.	Lat 43°22'15", long 74°32'47", at bridge on State Highway 10, 0.9 mile upstream from mouth, and 5.5 miles south of Piseco.	7.16	1962	7-30-62 9-25-62	0.76 .82
3335.2	Dill Creek near Petersburg, N. Y.	Lat 42°45'47", long 73°21'23", at bridge on county road, 0.3 mile east of Strilham hamlet, 1.0 mile northwest of Petersburg, and 1.1 miles upstream from mouth.		1962	8-9-62 8-23-62	.15 .10
3357	Anthony Kill at Mechanicville, N. Y.	Lat 42°55'05", long 73°42'53", at 4th Highway bridge above State Highway 146, 1.8 miles above mouth at Mechanicville.	62.4	1954-62	9-21-62	9.77
3357.5	Deep Kill at Melrose, N. Y.	Lat 42°49'52", long 73°37'35", at bridge on State Highway 40, at Grant Hollow, 0.3 mile upstream from unnamed tributary and 0.7 mile south of Melrose.		1962	7-20-62 8-9-62	.66 .22
3427.9	South Branch West Canada Creek near Morehouseville, N. Y.	Lat 43°23'59", long 74°44'30", at bridge on Martin's Mountain Home Road, 0.3 mile downstream from Wilmurt Lake Outlet, 0.35 mile north of State Highway 8, 1.7 miles northeast of Morehouseville, and 5 3/4 miles upstream from mouth.	40.2	1961-62	6-27-62 8-16-62	15.2 33.0
*3509	Beaverdam Creek near Knox, N. Y.	Lat 42°38'57", long 74°07'56", at bridge on farm road 1.2 miles south of Knox, and 1.7 miles upstream from mouth.		1962	7-26-62	.01
*3509.5	Switz Kill near Berne, N. Y.	Lat 42°36'41", long 74°09'24", at bridge on county highway, 1.2 miles upstream from mouth, and 1.3 miles southwest of Berne.		1962	7-25-62	.49
3515.1	Bowman Creek at Burtonsville, N. Y.	Lat 42°48'19", long 74°14'50", at culvert on Eaton Corners Road, 0.5 mile east of Schoharie Creek bridge at Burtonsville, and 0.7 mile upstream from mouth.		1962	7-20-62 8-13-62	0 .01
3540.8	South Chuctanunda Creek at Amsterdam, N. Y.	Lat 42°56'04", long 74°12'44", at bridge on Florida Street, at Amsterdam, 0.2 mile downstream from State Highway 55 and 0.7 mile upstream from mouth.	31.7	1961-62	6-27-62 7-20-62 8-15-62	.42 .07 .63
*3542	Sandsea Kill at Pattersonville, N. Y.	Lat 42°53'20", long 74°04'42", at bridge on State Highway 55, at Pattersonville.	9.56	1957, 1959-62	7-19-62	0
3544.7	Poentic Kill at Schenectady, N. Y.	Lat 42°48'31", long 73°59'32", at bridge on Campbell Road at Schonowe, and 0.7 mile northwest of Schenectady City Line.		1962	7-19-62 8-13-62	2.78 5.18
3549.5	Crabb Kill near Glenville, N. Y.	Lat 42°55'58", long 74°01'00", at bridge on State Highway 147, 500 ft downstream from Fallentree Kill and 1.8 miles east of Glenville.		1962	7-20-62 8-15-62	0 .19
3554.5	Indian Kill near Alplaus, N. Y.	Lat 42°52'12", long 73°54'18", at bridge on Hetcheltown Road at Glenridge, 0.2 mile upstream from mouth, and 1.1 miles north of Alplaus.		1962	7-19-62 8-13-62	.50 1.74
3563	Shaker Creek near Latham, N. Y.	Lat 42°45'49", long 73°47'33", 500 ft downstream from unnamed tributary 1,000 ft downstream from State Highway 7, 1 1/4 miles upstream from mouth, and 1 3/4 miles west of Latham.	11.2	1960-62	4-27-62	8.13
*3591	Wynants Kill at Wynantskill, N. Y.	Lat 42°41'44", long 73°38'44", at bridge on Brookside Avenue, at Wynantskill, 0.4 mile upstream from unnamed tributary, and 4 miles upstream from mouth.	29.1	1961-62	4-27-62 6-20-62 7-3-62 8-9-62 8-17-62 8-24-62 9-5-62 9-25-62	19.6 8.56 5.52 5.64 5.14 5.44 5.51 4.63
3591.1	Jordan Creek at Troy, N. Y.	Lat 42°41'15", long 73°41'38", 125 ft downstream from Jordan Road, 0.5 mile south of city line of Troy.	.65	1960-62	4-27-62 7-6-62 8-9-62	.39 .13 .11

* Also a crest-stage partial-record station.

Discharge measurements made at miscellaneous sites during water year 1973--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	previously (water years)	Measurements	
					Date	Discharge (cfs)
Hudson River basin--Continued						
01330905 Fish Creek	Hudson River	Lat 43°06'24", long 73°37'02", Saratoga County, at bridge on State Highway 29, in Grangerville 0.2 mile east of DeGarmo Road and 2.9 miles upstream from mouth.	-	-	3- 1-73	285
					4- 7-73	1,470
					5- 4-73	480
					6- 1-73	734
					7-10-73	173
					8- 6-73	124
9- 7-73	89					
01333350 Hoosic River	Hudson River	Lat 42°48'33", long 73°17'12", Bennington County, Vt. at bridge on State Highway 346 on N.Y.-Vt. State Line, 1.3 miles northwest of North Pownal.	1965	1967-73	4-10-73	1710
01335639 Ballston Creek	Round Lake	Lat 42°56'29", long 73°47'26", Saratoga County, at bridge on Goldfoot Road in Round Lake 0.3 mile upstream from mouth.	17.8	-	3- 3-73	5.3
					4- 7-73	95
					5- 7-73	12
					5-31-73	26
					7-10-73	6.5
					8- 6-73	.79
9-14-73	.22					
01335640 Ballston Creek	Round Lake	Lat 42°56'22", long 73°47'22", Saratoga County, 197 at bridge on Maltaville Road at Round Lake, and 0.1 mile upstream from mouth.	197	-		
01335651 Luther Brook	Round Lake	Lat 42°56'41", long 73°47'04", Saratoga County, at culvert on Maltaville Road in Maltaville, and 0.3 mile upstream from mouth.	3.89	-	3- 3-73	4.0
					4- 7-73	6.4
					5- 7-73	4.2
					5-31-73	5.8
					7-10-73	3.6
					8- 6-73	3.3
9-14-73	3.2					
01335657 Round Lake Tributary #1	Round Lake	Lat 42°55'57", long 73°47'28", Saratoga County, at culvert on U.S. Highway 9 in Round Lake 0.1 mile upstream from mouth.	.60	-	3- 2-73	.54
					4- 6-73	3.0
					5- 7-73	.44
					5-31-73	1.3
					7-10-73	.23
					8- 6-73	.23
9-14-73	.08					
01335657 Round Lake Tributary #2	Round Lake	Lat 42°55'43", long 73°47'30", Saratoga County, at culvert on U.S. Highway 9 0.2 mile upstream from mouth, and 0.7 mile south of Round Lake.	2.19	-	3- 2-73	1.0
					4- 6-73	7.2
					5- 7-73	1.3
					5-31-73	4.6
					7-10-73	.58
					8- 6-73	.56
9-14-73	.49					
01335660 Round Lake Tributary #3	Round Lake	Lat 42°56'15", long 73°46'15", Saratoga County, at culvert on State Highway 67 0.2 mile upstream from mouth, and 0.8 mile southeast of Maltaville.	.87	-	2- 8-73	.70
					3- 3-73	1.2
					4- 7-73	2.1
					5- 7-73	.32
					5-31-73	1.8
					7-10-73	.13
8- 6-73	.07					
9-14-73	.02					
01335698 Anthony Kill	Hudson River	Lat 42°53'13", long 73°44'50", Saratoga County, at Coons, at bridge on Coons crossing road 0.2 mi south of State Highway 67 and 2.5 mi west of Mechanicville and 4.2 mi upstream from mouth.	64.6	1973	3- 3-73	40
					4- 7-73	330
					5- 7-73	50
					5-31-73	135
01350101 Schoharie Creek	Mohawk River	Lat 42°23'51", long 74°27'02", Schoharie County, at bridge on County Highway 342, 0.2 mile west of village of Gilboa, and 0.4 mile downstream from Gilboa Dam.	-	1969-72	5-14-73	808
					7-27-73	1.1
					8-30-73	.42
01350120 Platter Kill	Schoharie Creek	Lat 42°24'15", long 74°26'38", Schoharie County, at culvert on county road, 0.3 mile upstream from mouth, and 0.6 mile northeast of Gilboa.	-	1969-72	10- 5-72	1.3
					3- 7-73	13
					4-11-73	49
					5-15-73	16
					7-27-73	6.4
					8-30-73	1.9

Discharge measurements made at miscellaneous sites during water year 1974--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Hudson River basin--Continued						
01335499 Hudson River Tributary #15	Hudson River	Lat 42°54'57", long 73°40'56", Saratoga County, at bridge on U.S. Highway 4, in Riverside, 100 feet (30 m) upstream from mouth, and 0.3 mile (0.5 km) northeast of Mechanicville.			8-16-74	a 0
01335639 Ballston Creek	Round Lake	Lat 42°56'29", long 73°47'28", Saratoga County, at bridge on Goldfoot Road in Round Lake 0.3 mile (0.5 km) upstream from mouth.	17.8	1973	10- 9-73	1.99
01335651 Luther Brook	Round Lake	Lat 42°56'41", long 73°47'04", Saratoga County, at culvert on Maltaville Road in Maltaville, and 0.3 mile (0.5 km) upstream from mouth.	3.89	1973	10- 9-73	3.0
01335653 Round Lake Tributary #1	Round Lake	Lat 42°55'57", long 73°47'28", Saratoga County, at culvert on U.S. Highway 9, in Round Lake 0.1 mile (0.2 km) upstream from mouth.	.60	1973	10- 9-73	T
01335657 Round Lake Tributary #2	Round Lake	Lat 42°55'43", long 73°47'30", Saratoga County, at culvert on U.S. Highway 9, 0.2 mile (0.3 km) upstream from mouth, and 0.7 mile (1.1 km) south of Round Lake.	2.19	1973	10- 9-73	.40
01335660 Round Lake Tributary #3	Round Lake	Lat 42°56'15", long 73°46'15", Saratoga County, at culvert on State Highway 67, 0.2 mile (0.3 km) upstream from mouth, and 0.8 mile (1.3 km) southeast of Maltaville.	.87	1973	10- 9-73	T
→ 01335698 Anthony Kill	Hudson River	Lat 42°53'13", long 73°44'50", Saratoga County, at Coons, at bridge on Coons crossing road, 0.2 mile (0.3 km) south of State Highway 67, and 2.5 miles (5.6 km) west of Mechanicville, and 4.2 miles (6.8 km) upstream from mouth.	64.6	1973	10- 9-73	15 ←
→ 01335703 Anthony Kill	Hudson River	Lat 42°54'13", long 73°41'10", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, and 0.3 mile (0.5 km) south of State Highway 67.			8-16-74	a 11.5 ←
01335707 Hudson River Tributary #29	Hudson River	Lat 42°53'13", long 73°41'14", Saratoga County, at bridge on U.S. Highway 4, at Mechanicville city line, 0.3 mile (0.5 km) upstream from mouth, and 1.4 miles (2.2 km) south of State Highway 67.			8-16-74	a 0.25
01335709 Hudson River Tributary #30	Hudson River	Lat 42°53'06", long 73°41'09", Saratoga County, at culvert on U.S. Highway 4, 300 feet (91 m) upstream from mouth, 0.2 mile (0.3 km) south of Mechanicville, and 1.7 miles (2.7 km) south of Mechanicville.			8-16-74	a 0
01335712 Hudson River Tributary #31	Hudson River	Lat 42°52'47", long 73°41'01", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, 0.6 mile (1.0 km) south of Mechanicville, and 2.1 miles (3.4 km) south of State Highway 67.			8-16-74	a 0.17
01335720 Hudson River Tributary #32	Hudson River	Lat 42°51'47", long 73°40'42", Saratoga County, at bridge on U.S. Highway 4, 250 feet (76 m) upstream from mouth, and 2.4 miles (3.9 km) southeast of Newtown.			8-16-74	a e 0.15
01335730 McDonald Creek	Hudson River	Lat 42°51'07", long 73°40'37", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, and 2.7 miles (4.3 km) southeast of Newton.			8-16-74	a 1.8
01335740 Hudson River Tributary #33	Hudson River	Lat 42°50'22", long 73°40'30", Saratoga County, at bridge on U.S. Highway 4, 0.1 mile (0.2 km) upstream from mouth, and 2.5 miles (4.0 km) west of Malrose.			8-16-74	a 0.76
01335744 Hudson River Tributary #34	Hudson River	Lat 42°50'04", long 73°40'12", Saratoga County, at bridge on U.S. Highway 4, 400 feet (122 m) upstream from mouth, 2.2 miles (3.5 km) west of Grant Hollow, and 2.6 miles (4.2 km) north-east of Waterford.			8-16-74	a e 0.5

a A general ephemeral study made on August 16 of all stream channels in a localized area.

e Estimated.

T Trace.

01335698	Anthony Kill at Coons.....	42 55 13 73 44 50 091	64.6	3- 3-73 4- 7-73 5- 7-73 5-31-73 7-10-73 8- 6-73 9-14-73 10- 9-73 5-26-54 9- 2-54 9-15-54 9-27-54 10-17-54 8-16-56 8-30-56 5-10-57 8-14-58 10-10-58 4- 2-59 4-22-59 6- 6-60 8- 9-60 8- 9-61 9-21-62 8-16-74 8-16-74	*40.1 330 50.1 135 *9.15 21.8 *12.1 *15.4 *123 *31.5 *19.5 *18.7 *28.6 *12.5 *22.3 *11.0 *12.5 *210 *73.1 *213 *23.6 *19.5 *9.77 *11.5 *25 0 *17 *15 *1.8 *76 *a.05 *a.3 *9.90 *9.59 *8.7
01335700	Anthony Kill at Mechanicsville..... (includes Plum Brook watershed)	12 55 05 73 42 53 091	62.4		
01335703 01335707 01335709 01335712 01335720 01335730 01335740 01335744 01335760 01335785 01335800	Anthony Kill at Mechanicsville..... Hudson River tributary no. 29 at Mechanicville..... Hudson River tributary no. 30 at Mechanicville..... Hudson River tributary no. 31 at Mechanicville..... Hudson River tributary no. 32 near Newtown McDonald Creek near Newtown..... Hudson River tributary no. 33 near Melrose Hudson River tributary no. 34 near Waterford..... Hudson River tributary no. 35 near Waterford..... Mohawk River, West Branch, at West Branch. Mohawk River at Hillside.....	42 54 13 73 41 10 091 42 53 13 73 41 14 091 42 53 06 73 41 09 091 42 52 47 73 41 01 091 42 51 47 73 40 42 091 42 51 07 73 40 37 091 42 50 22 73 40 30 091 42 50 04 73 40 12 091 12 49 00 73 39 57 091 43 22 05 75 28 52 065 43 21 18 75 23 02 065			

APPENDIX D

REFERENCES

APPENDIX B

REFERENCES

- 1) B.B. Eissler; Low-Flow Frequency Analysis of Streams in New York - Bulletin 74; U.S. Geological Survey 1979.
- 2) P.E. Kent; Luther Forest Environmental Impact Statement, 1978.
- 3) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.
- 4) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.
- U.S. Army Corps of Engineers:
- 5) HEC-1 Flood Hydrograph Package - Dam Safety Version, September 1978.
- 6) Engineering Manual 1110-2-1405; Flood-Hydrograph Analyses and Computation, August 1959.
- 7) U.S. Department of Agriculture, Soil Conservation Service; National Engineering Handbook; Section 4 -Hydrology, August 1972.
- 8) US Department of Commerce; Weather Bureau:
Hydrometeorological Report No. 33:
Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6,12,24, and 48 hours, April 1956.
- 9) US Department of Interior; BUREC
Design of Small Dams, 2nd edition (rev.reprint), 1977.
- US Geological Survey:
- 10) Water Resources Data for New York - 1961; Part 1-Surface Water Records
- 11) Water " " " " " - 1962;
- 12) Water " " " " " - 1973:
- 13) Water " " " " " - 1974;

APPENDIX E

DRAWINGS AND RELATED DOCUMENTS



LUTHER FOREST
TAC LUTHER FOREST CORPORATION
THE ARCHITECTS COLLABORATIVE
 SAGATOGA COUNTY NEW YORK
 ALBANY NEW YORK
 CAMBRIDGE MASSACHUSETTS

PHYSIOGRAPHY

LEGEND

CHARACTERISTICS

SOIL

Well Drained Area

Moderately Well Drained Area

Poorly Drained Areas

TOPOGRAPHIC

High Points, Low Points

Major Watershed Divide

Topographic Divide

Ridge Lines

Topographic Edges

HYDROLOGIC

Wetlands

Open Water

Ephemeral Streams

Intermittent Streams

Perennial Streams

Section III sewage will be handled by approved on-site sewage disposal systems.

3. Storm Water System

Section I storm water drainage occurs primarily vertically through the highly porous sand to a water table of 20 ft. below the surface and then runs horizontally to the mouth of the ravines where it emerges as streams which run either northerly to Saratoga Lake or southerly to Round Lake. No water in Section I drains into Section II.

Section II lies in four watersheds: A small portion in its southwesterly corner drains to Round Lake, its northwest corner drains to Saratoga Lake, its northeasterly corner drains into Schuyler Creek, and its southeasterly corner drains to the Mechanicville Reservoir and Plum Brook. Obviously drainage toward the Mechanicville Reservoir and Plum Creek is environmentally sensitive since these are water sources for the City of Mechanicville. The environmental impacts will be properly addressed and mitigated in the environmental impact statement on Section II.

Section III has 980 acres in the Saratoga Lake watershed; 66 acres are in the Schuyler Creek watershed.

4. Traffic

Section I traffic will be directed by way of Plains Road and Dunning St. onto either Route 9 or Northway Exit 12. A small portion of the traffic from the northern end of Section I may create traffic on Plains Road to Route 9P to Route 9 to Exit 13.

Section II northbound traffic will be directed to Lake Road, 9P, 9, and then Exit 13. Southbound traffic from Section II will be directed to Route 67 to Route 9 to Exit 10 on the Northway. Westbound traffic will use either the northbound or southbound route to Route 9 and then to Route 67. Eastbound traffic from Section II is adequately served by existing roads.

7. Zoning

A Master Plan (Figure 4), has been prepared on all three sections.

Section I also has been re-zoned in accordance with the zoning plan, (Figure 5), and a site plan (Figure 6), attached. It can be seen from the site plan that the option to use Area 4 of the zoning map as a light manufacturing area has been taken and that the current market conditions indicate that Areas 1, 2, and 3 will be predominantly and perhaps exclusively single family detached homes. The rest of the area in Section I north of Dunning St. may or may not develop with the housing mix shown.

→ Section II has neither been re-zoned nor planned beyond the Master Plan shown in Figure 4.

Section III, the first subdivision of 10 mini-estates, was approved on May 16, 1977 and is attached as Figure 7. All 10 lots in the first subdivision have been sold. The second subdivision consisting of Mini-estates Nos. 11 - 22 was approved by the Stillwater Planning Board on June 19, 1978, and is attached as Figure 8. All the land within Section III is already zoned rural residential which permits a single family dwelling on one acre lots with 150 ft. of frontage. As can be seen on the first two mini-estate subdivision maps attached as Figures 7 and 8, the mini-estates exceed the zoning specifications.

8. Statement Supporting Separation of Luther Forest into Three Distinct Sections

It has been demonstrated above that the environmental and engineering factors are separate for each of the three sections of this project. Therefore it is concluded that the public's interests are best served by reviewing Luther Forest as three separate and distinct projects with primary impact on different communities and facilities.

In addition to the logical geographic and political separation of these three areas for the purposes of such a statement, is the question of timing. It would perhaps be to the developer's best interests "to sweep" Section II through along with the approval of Section I because environmental laws are continually becoming more stringent. However, this would require projecting unknowns so far into the future that the statement would really be of marginal value for planning purposes. The Section I rate of development is limited to a maximum of 200 residential units per year by Section 7 of the Planned Development District Legislation (attached as Appendix B). This implies that it would be at least 8 years before construction occurs in Section II. The developer feels that a more accurate and valid environmental impact statement can be written on Section II after observing the actual experience with implementation of Section I.

As shown above, Section III exceeds existing zoning requirements, is of low density (consisting of approximately 110 mini-estates widely distributed over 1,046 acres) and is based on known well and septic system information in the area. Further, from the experience drawn from the demographic profiles of the purchasers of the first 10 mini-estates in Section III it is clear that these are primarily purchased by working professional couples with no children.

In the developer's view the preparation of an environmental impact statement on Section III would not result in identifying any adverse environmental impact or alter the planning in any meaningful way. Therefore, this environmental impact statement will cover only Section I (Malta).

C. Type of Action

Luther Forest received Planned Development District zoning approval from the Town Board of Malta on August 30, 1977. New zoning is best shown by the map and tables already attached as Figure 5. The legislation enabling this rezoning

soils on the property are deep and moderately to rapidly permeable. Over two-thirds of the property is covered by the Colonie series of soils; these are deep, well to excessively drained, very strongly acidic, coarse textured soils. Muck soil, essentially undrained organic matter, silt and clay, is found in closed depressions. Other less well drained soils are located primarily in topographic lows such as swales and stream valleys.

In addition to differentiating among soil types, the attached soils map, Figure 9, indicates erosion potential and slope. U.S.D.A. Soil Conservation Service nomenclature are used on the map. Figure 10 lists the U.S.D.A. constraints for each soil.

Brief soil descriptions from data provided by the U.S.D.A. Soil Conservation Service of the major soil types found in Luther Forest follow:

Alluvial Land: Alluvial land is made up of materials that have washed from adjacent uplands. It occurs along minor streams on small terraces and nearly flat, narrow bottoms of stream valleys. Drainage ranges from good to very poor. Most alluvial land is made up of recent soil material; however, materials from remnants of small terraces are included in some areas.

Colonie Series: Colonie soils are deep, well to excessively drained, very strongly acidic, coarse textured soils that have formed in deltaic or aeolian sands. They occupy nearly level to gently rolling areas and moderately steep to steeply dissected landforms. Colonie soils have 4 to 12 feet or more of rapidly permeable, yellowish-brown fine sands and loamy fine sands that contain moderately permeable, thin brown bands of finer textured material.

Hoosic Series: These are deep, well-drained, strongly acidic, gravelly soils developed on stratified out-washes which are composed chiefly of acidic slates, shale and sandstone. They occupy nearly level to steeply rolling areas. Hoosic soils have from 2 to 3 feet of rapidly permeable, yellowish-brown, gravelly loam and sandy loam over very rapidly permeable stratified sand and gravel.

Hudson Series: Hudson soils are deep, moderately well to well drained, medium acid to neutral, fine textured soils that form in calcareous clayey glacial lake deposits. They occupy level to dissected lake plains. Hudson soils have 1 to 2 feet of moderately to slowly permeable silt loam or silty clay loam over slowly permeable silty clay to a depth of $3\frac{1}{2}$ feet. These materials are underlain by slowly permeable lake-laid deposits consisting of layers of silty clay or clay separated by thinner silty layers.

Muck: These are areas of undifferentiated kinds of organic soils. They include areas of mostly decomposed muck from woody plants, sedges, reeds, cattails and rushes as well as more limited areas of almost undecomposed peat. These deposits vary from more than 20 inches to 20 feet thick, over clay, marl or sand. They occur in closed depressions that have remained undrained for the most part.

Stafford Series: Stafford soils are deep, somewhat poorly drained, strongly to slightly acidic, coarse textured soils that formed in moderately acidic to neutral deltaic or aeolian sands. They occupy nearly level to gently sloping areas of sandy deltas and plains. Stafford soils have $1/2$ to 1 foot of loamy fine sand over 3 to 10 feet of rapidly permeable loamy fine sand or fine sand.

..."it is the intent of the Legislature that all agencies conduct their affairs with an awareness that they are the stewards of the air, water, land and living resources and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations."

It is felt that through the new Environmental Laws and through cooperation, both ERDA and Luther can function to provide new jobs and maintain a high sensitivity to the quality of the environment.

II. ENVIRONMENTAL FACTORS AND IMPACTS

A. Geology and Soils

1. Geological character, bedrock and surficial

The rock underlying Luther Forest consists primarily of black shale with local interbedded sandstone. Canojoharie shale underlies most of the tract while the Austin Glen and Mount Merino Formations underlie part of the east side of the property. Bedrock is exposed in several places in or adjacent to Luther Forest. Elsewhere bedrock lies buried beneath thick glacial lake and aeolian sediments generally to a depth of 50 to 200 feet, even in the ravines. Bedrock in the central and western portions of the property is crossed by the north-south trending main channel of the preglacial Hudson River known as the Colonie Channel. The deepest part of the channel is estimated to be below elevation 100 feet or well over 200 feet beneath the surface.

A generalized bedrock topography map for eastern Saratoga County, adapted from Stearns and Wheler, 1968, is shown on Page 41 of Exhibit 10.

2. Soils Characteristics

The major portion of the Luther Forest is covered by deltaic and aeolian sands (see Figure 9). Most of the

21.

The area is not well suited to agricultural use. The Colonie fine sandy loam soil which covers over two-thirds of the project area is well drained (dry) and does not support an abundant plant life.¹

3. Slopes and Topography

Slopes vary from near 0% on flat terraces up to 60% in deeply dissected ravines. With the exception of steep slopes the potential for soil erosion, mass wasting and run-off are low throughout the Luther Forest.

Figure 11 is a topographic map of the Luther Forest and adjacent land.

4. Landforms

Landforms within Luther Forest reflect clearly the strong influence of glaciation as well as post-glacial surficial processes. During glaciation drainage of the ancestral Hudson River was blocked south of Kingston, New York, creating a large lake known as Lake Albany, which extended well north of the site. Fine sand, silt and clay were deposited in the Lake, blanketing hundreds of square miles. Additional unconsolidated sediment was deposited on and around Luther Forest by a southward flowing stream which entered Lake Albany near the south end of what is now Saratoga Lake, creating an extensive delta known as the Malta Delta. Surficial expression of this delta, which comprises a major portion of the Luther tract, is a plain highest directly south of Saratoga Lake, decreasing gradually in elevation to the southeast and west. Average elevation of the plain is 350 feet above sea level. Several hills reach 430 feet. Streams emanating radially from the central portion of the site have down-cut the unconsolidated fine sands to elevations as low as 207 feet, forming narrow, steep-sided ravines.

¹Letter from James A. Moredock, Agronomist -to- William R. Mackay, May 2, 1978 (See Figure 21)

Developer assures city he will consult it on project plan

6-18-78

By CLAYTON BOYCE
Staff Writer

MECHANICVILLE — The developer of the 6,800 acre Luther Forest housing project assured city officials Wednesday he will consult them before beginning construction of the Stillwater section of the project.

The city officials are concerned that the drilling of wells to supply the Stillwater section with water will threaten the city's reservoir.

William R. Mackay, president of the Luther Forest Corporation, said he has withdrawn applications for the Stillwater section of the development, and it will be at least two years before construction of the section begins. "When we start working on the Stillwater section, we'll come to you," Mackay promised during a meeting with the City Council.

Mackay and D. Theodore Clark, a hydro-geologist hired by the Luther Forest Corporation, said the 2,157 acre Malta section of the development will have no effect on the city's reservoir in the Town of Stillwater. Clark said wells drilled at a sandy site off Knapp Road near Maltaville will provide 600 to 700 gallons per minute, enough for the Malta section of the development.

According to a report Clark prepared for the engineer of the Luther Forest development, the watershed tapped by the Maltaville wells is separate from the watershed that feeds the city's reservoir. Clark said the well site has "a different watershed, a different aquifer, different everything."

Mackay said he withdrew the applications for the Stillwater section because "we realize there are problems there." He said the corporation "didn't have the money to spend" to solve the problems. It could be as long as seven years before the Stillwater section is begun, he said, depending on the success of the Malta section.

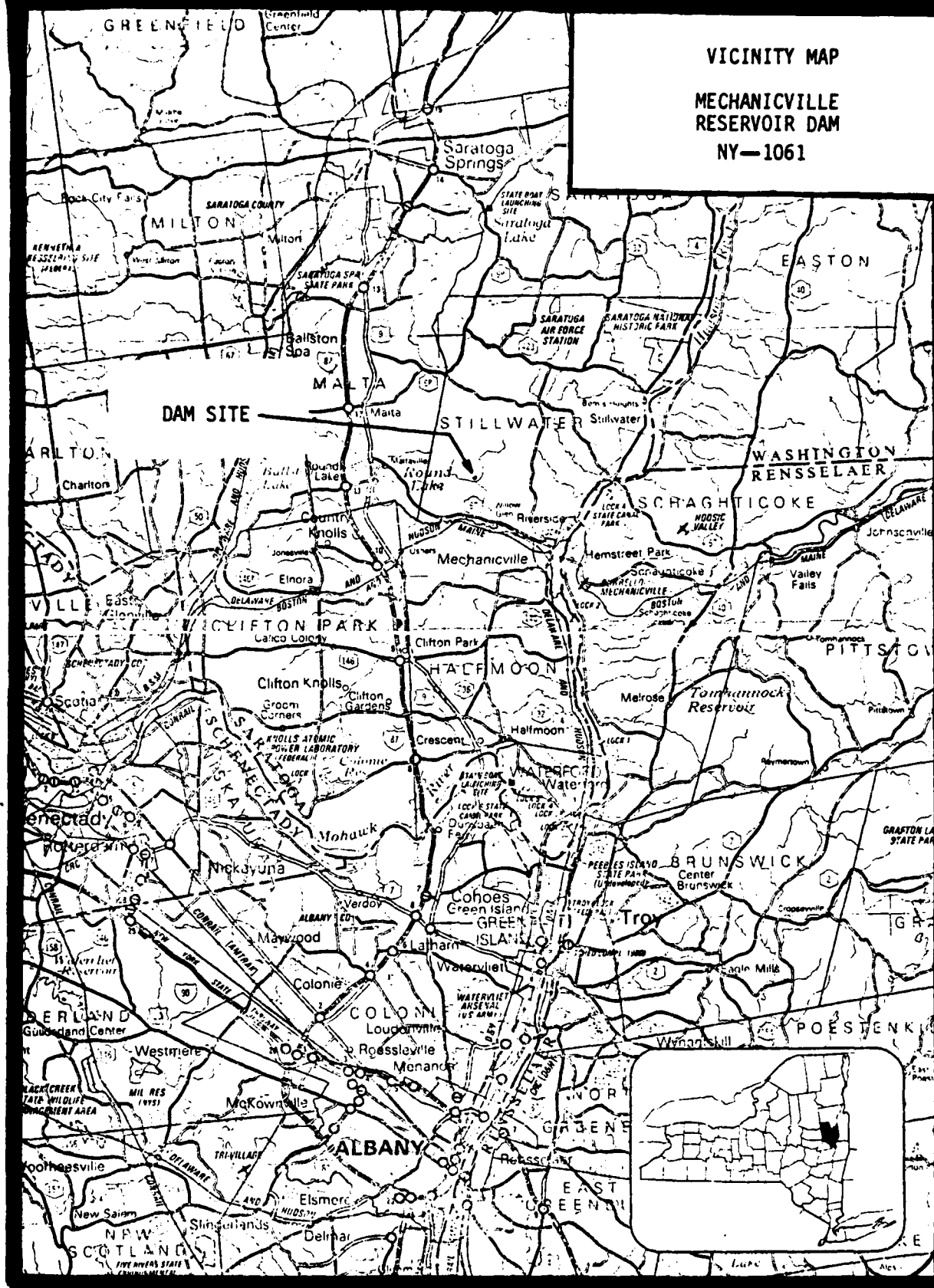
Mayor John H. Fascia said he has "no objections to plans for Malta." But "our watersupply is our livelihood," he said.

Mason Barber, city water

superintendent, said the developer could build south of County Highway 75, and still not affect the watershed feeding the city reservoir. Mackay replied he will "certainly talk to (city officials) if we go south of 75."

C-54

MECHANICVILLE
RESERVOIR DAM
NY-1061



SARATOGA COUNTY

